BEST PRACTICES IN ECOLOGICAL SANITATION PROJECTS

CASE: DEVELOPMENT PROJECT IN ZAMBIA

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HÄMEEN AMMATTIKORKEAKOULU

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Hanna Töykkälä

HAMK
HÄMEEN AMMATTIKORKEAKOULU

TIIVISTELMÄ

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TIIVISTELMÄ

Opinnäytetyön tavoitteena oli selvittää parhaat käytännöt, joilla ekologista sanitaatiota edistävä kehitysyhteistyöhanke onnistuu ja saa aikaan kestäviä tuloksia. Ekologisen sanitaation pääajatuksena on veden säästäminen, ravinteiden kierto sekä ihmisten ja ympäristön hyvinvoinnin varmistaminen. Työn toimeksiantaja oli tamperelainen ekologisen sanitaation puolesta toimiva kansalaisjärjestö Käymäläseura Huussi ry, jonka kehitysyhteistyöhanke Zambia Sanitation Project ZASP:n yhtenä tavoitteena on ollut luoda toimintatapoja vastaavien kestävää sanitaatiota edistävien projektien toteuttamiseksi. Tämän opinnäytetyön tarkoituksena oli kerätä kyseisen hankkeen kokemukset ja koota niiden perusteella opas, jota kansalaisjärjestöt voivat tulevaisuudessa hyödyntää sanitaatiohankkeiden toteutuksessa.

Työn teoreettinen viitekehys koostui ekologisesta sanitaatiosta sekä kehitysyhteistyöprojektien hallinnasta. Ekologisen sanitaation periaatteet ja hyödyt esiteltiin käsitellen samalla myös maailman yleistä sanitaatiotilannetta. Kehitysyhteistyöhankkeen toteutukseen tutustuttiin vaihe vaiheelta ensin yleisellä tasolla ja sitten sanitaatiohankkeisiin keskittyen. Teoriaosiossa nostettiin esille myös erilaisia osallistavia menetelmiä ja kulttuurisensitiivisyyttä.

Tutkimusmetodina sovellettiin tapaustutkimusta, joka toteutettiin keräten tietoa ZASP:n aikana laadituista arvioinneista, raporteista, suunnitelmista ja tutkimuksista. Saatu tieto yhdistettiin teoriapohjaan sekä kokemuksiin muista vastaavista projekteista. Tuloksena syntyi opas, johon koottiin tutkimusprosessin aikana kerätyt sanitaatiohankkeen toteuttamisen parhaat käytännöt. Oppaassa käydään kohta kohdalta läpi hankkeiden suunnittelu ja toteutus. Oppaassa korostetaan opetuksen, osallistavien menetelmien ja kulttuurin huomioimisen merkitystä aina suunnittelun aloittamisesta loppuarviointiin saakka. Jotta projektin tuloksista saataisiin kestäviä, on avunsaajien tunnettava projekti ja sen tulokset omikseen.

Avainsanat kehitysyhteistyö, projektinhallinta, ekologinen sanitaatio

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ABSTRACT

The objective of the thesis was to find out the best practices to succeed in an ecological sanitation development project and to achieve sustainable results. The principle of ecological sanitation is saving of water, the nutrient cycle, and the well-being of people and the environment. The thesis was done for Global Dry Toilet Association of Finland which is a non-governmental organization that promotes ecological sanitation. It has a development project Zambia Sanitation Project, ZASP, one aim of which has been to create an operation model to carry out similar projects that focus on ecological sanitation. The purpose of this study was to collect experiences from ZASP and make a guide which organizations can utilize when executing ecological sanitation projects in the future.

The theoretical framework of the thesis consisted of ecological sanitation and management of development projects. The principles and benefits of ecological sanitation were introduced discussing also the global sanitation situation. Managing of development projects was explored step by step first on a general level and then focusing on ecological sanitation projects. Different participatory methods and cultural sensitivity were emphasized in the theory phase.

Case study was applied to execute the study. Material was collected from evaluations, reports, plans, and studies made during ZASP. The gained information was combined with the theory base and with experiences from similar projects. As a result a guide was made in which the collected best practices to carry out an ecological sanitation project were gathered. The guide follows the project process steps of planning and implementation. In the guide the importance of education, participatory methods, and cultural sensitivity are emphasized all the way from planning to the final evaluation. In order to achieve sustainable results, the beneficiaries of the project have to feel the project and its results as their own.

Keywords development cooperation, project management, ecological sanitation

Pages 68 p. + appendices 15 p.

ABBREVIATIONS

CBE	Community based enterprise
CLTS	Community-led total sanitation
Ecosan	Ecological sanitation
DAC	Development Assistance Committee by OECD
GDTF	Global Dry Toilet Association of Finland
GDP	Gross domestic product
GLM	Green Living Movement
KTZ	Kaloko Trust Zambia
MDG	Millennium Development Goal by the United Nations
NETSSAF	Network for the development of Sustainable Approaches for large scale implementation of Sanitation in Africa
NGO	Non-governmental organization
OECD	Organisation for Economic Co-operation and Development
PHAST	Participatory hygiene and sanitation transformation
PLA	Participatory learning and action
PRA	Participatory rural appraisal
SARAR	Self-esteem, associative strengths, resourcefulness, action planning, and responsibility
SWOT analysis	Analysis on strengths, weaknesses, opportunities, and threats
UDDT	Urine diverting dry toilet
UNICEF	The United Nations Children's Fund
UNDP	The United Nations Development Programme
WHO	The World Health Organization
ZASP	Zambia Sanitation Project

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1 INTRODUCTION

Mahatma Gandhi said in 1925, "sanitation is more important than independence". Yet there are about 2.5 billion people in the world who do not have access to proper sanitation facilities. Compared to the huge influence that the quality and availability of sanitation possibilities have on people's lives, there is very little public concern concentrating on improving the poor sanitation situation especially in developing countries. Besides health, proper sanitation has a huge influence for instance on people's capability to work and attend school – and consequently on the well-being and wealth of communities and eventually whole nations. The Millennium Development Goal of the United Nations focusing on environmental sustainability aims also at halving the number of people suffering from a lack of improved sanitation facilities by 2015. It has been noticed that new approaches are needed since the conventional sewerage-based sanitation cannot solve the problem in all areas.

Nowadays the concept of ecological sanitation (ecosan) is widely acknowledged and accepted to be efficient way to execute sanitation. It is especially good in areas that suffer from a lack of fresh water. Ecosan solutions are based on the principle of the nutrient cycle: a closed nutrient cycle brings nutrients back to the soil. This way even some income can be made by growing crops using toilet fertilizers. Thus, development projects that focus on the promoting of ecosan solutions do not only improve the sanitation situation but also provide people with ways to make a difference in their economic situation and livelihoods.

Although people in developing countries may have the will to improve their sanitation situation, they usually have very little knowledge and skills to do it. Non-governmental organizations (NGOs) are good executors of these kinds of grass-root level sanitation projects. However, only few actors focus only on sanitation despite its importance. Finnish non-governmental organization Global Dry Toilet Association of Finland (GDTF) is one of them. It promotes sustainable and dry sanitation both in Finland and worldwide, and its pilot project takes places in rural Zambia. This project, called Zambia Sanitation Project, focuses on promoting dry sanitation and the principle of the nutrient cycle as well as empowering the local communities to take responsibility for their sanitation situation. The aim of this thesis is to collect and analyze the experiences from this project and compare the gained material with similar projects. Based on this, a guide of best practices on how to carry out an ecosan development project is made. NGOs working in this sector, including GDTF itself, can utilize the results in their future projects.

There have been too many unsuccessful development projects where the constructed toilets have been left unused or drilled boreholes have broken down after the project has ended. This is why the local communities' sense of ownership of the project is essential in these kinds of projects. Questions such as "What are the practices that guarantee the results of the project to be long-lasting and sustainable?" are asked during the study

process and different kinds of ecosan project experiences are shared to find the answers. The study is mirrored with an existing theoretical framework in order to guarantee reliability. The theory base starts with presenting the current situation which can be described to be nothing less than a global sanitation crisis. Ecological sanitation is introduced as a solution for this crisis that the world is facing. After that the principles of development project management are presented in order to combine them with ecosan promotion – finishing with enough knowledge to dive into the case study, Zambia Sanitation Project, and to find the best ways to carry out an ecosan development project and the methods to achieve sustainable project results.

2 ECOLOGICAL SANITATION

According to a definition by the World Health Organization, sanitation consists of methods to collect human excrete, urine, and community waste waters in a hygienic way. These methods consist of proper treatment of waste water or other end products as well as safe handling of food and drinking water. The goal is to improve the well-being of people and environment. In 2010 the United Nations General Assembly published a resolution which states that sanitation is an essential human right. (Huuhtanen & Laukkanen 2009, 6; O'Neill 2012a, 7.)

Proper sanitation plays an undeniably important part in people's health. It is however awfully often neglected especially in developing countries: most of the 2.5 billion people who do not have access to improved sanitation live in developing countries (Figure 1) (O'Neill 2012a, 7). It could even be claimed that inadequate sanitation is one of the biggest global challenges that the world is facing at the moment. According to the Millennium Development Goals Report 2012, daily "entire communities are exposed to the considerable health and environmental hazards of inadequate human waste disposal". New ways of executing sanitation are needed as the current popular techniques are not sufficient or in many areas even suitable due to for instance lack of water. Also the growing concern on environment issues requires more and more attention.

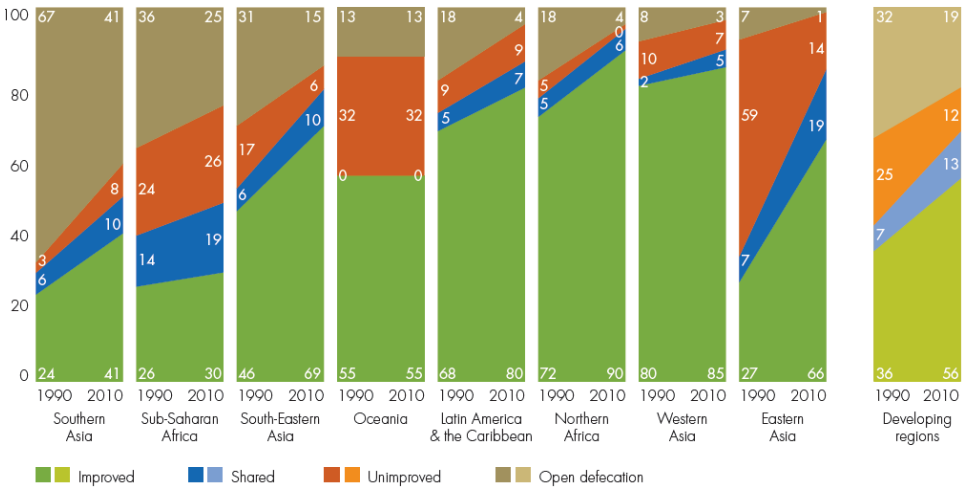


Figure 1. Proportion (%) of population using different sanitation practices in 1990 and 2010, according to the Millennium Development Goals Report 2012 (United Nations 2012, 54).

2.1 Global sanitation crisis

Majority of the people lacking proper sanitation system use unsafe and unhealthy sanitation facilities at home, but even 1.1 billion people do not have any toilet and have to defecate in the open. Over 70 percent of these people live in rural areas in developing countries. The lack of proper sanitation causes for example diarrhea and malnutrition and the ones that suffer from these water-related diseases are mainly children and women in developing countries (Langergraber & Muellegger 2005, 434). Unfortu-

nately this topic does not appeal to international discussions that tend to focus on problems such as HIV, malaria, and tuberculosis. However, these three diseases combined kill less people than diarrhea which could be prevented simply by clean water and proper hygiene and sanitation conditions. (Bartram & Cairncross 2010, 1; United Nations 2012, 55–56.) According to WHO (2011), in 2008 diarrhea was the fifth most common reason for death, causing the death of 2.5 million people, of which over 900,000 took place in Africa and over one million in South-East Asia.

2.1.1 Sanitation and development

United Nations General Assembly established Millennium Development Goals (MDGs) in 2000. The goals consist of eight targets that aim at solving the problems that are holding back the poor countries from developing. They are based on sustainable development and human rights, and are meant to be achieved by 2015. The seventh MDG concerns environmental sustainability and it has a target to halve the number of people without access to safe drinking water by the year 2015. In 2002, two years after the UN Summit set the MDGs, the access to basic sanitation was added to this goal. (Johannesburg Summit 2006; Yhdistyneet Kansakunnat 2012.) Basic sanitation means improved sanitation that is executed by flush or pour-flush toilets to sewer systems, septic tanks or pit latrines, ventilated improved pit latrines, pit latrines with slab, or composting toilets (Joint Monitoring Programme (JMP) for Water Supply and Sanitation n.d.). While the UN reports that the drinking water target has been achieved, the sanitation goal seems to be out of reach: about half of the population in developing countries still lacks the opportunity to use proper sanitation (United Nations n.d.). The progress of the sanitation situation in developing countries can be seen in Figure 2. It should be noticed that the absolute number of people who lack proper sanitation does not decrease in the same way due to population growth.

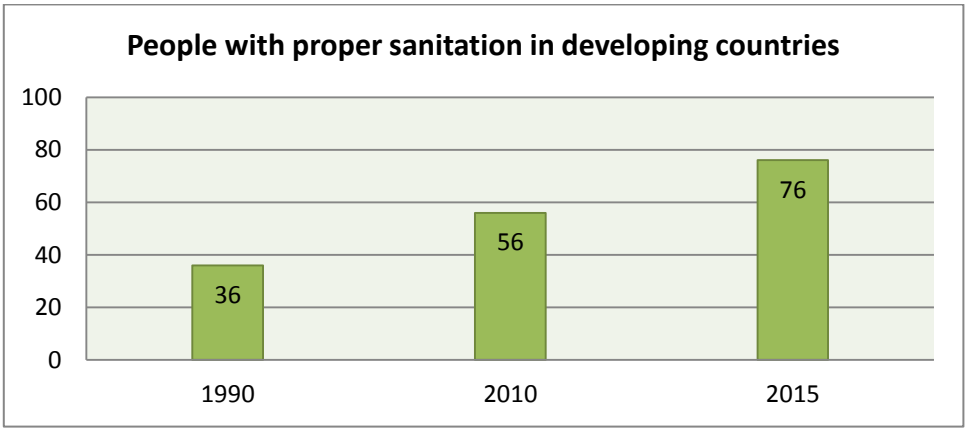


Figure 2. Percentage of people with an access to proper sanitation in developing countries in 1990 and 2010, and estimation for 2015 (Bartram & Cairncross 2010, 4).

The best progress has been made in Eastern and Southern Asia and the slowest in Western Asia, sub-Saharan Africa, and Oceania (United Nations 2012, 55). According to a report by the House of Commons Interna-

tional Development Committee, at the current progress the MDG on sanitation will not be met until the year 2076 – and even then 1.6 billion people would still live without proper sanitation. On a larger scale, the improving of water and sanitation sector in developing countries "contributes to practically all of the MDGs, yields benefits that can be valued at many times their own costs, and can reach even the poorest", as Bartram & Cairncross (2010) say. According to the UN itself, without the improvement of sanitation sector, none of the other MDGs can be achieved. This is proved also in a study for the Commission of Sustainable Development (2010) which reported that GDP per capita has grown more in those poor countries that have improved their water and sanitation situation than in the equally poor countries without the same improvements. (Bartram & Cairncross 2010, 4, 8; Jewitt 2011, 608–609.)

Despite the UN's goal on sanitation and many other efforts, sanitation is still only seldom mentioned in for example countries' national poverty reduction strategic plans – and even if it is, it usually has hardly any budget at all (Bartram & Cairncross 2010, 8). Unlike water issues, sanitation is very closely related to culture and also to gender, and according to Black and Fawcett (2008) one of the main problems is the taboo that surrounds the subject. The solution would be to learn to speak about sanitation and excrement. The poverty of people living in developing countries, a lack of politic will and decisions, poor planning on national and international levels, and a lack of proper investments have kept the sanitation sector from developing. (Huuhtanen 2012, 50; Jewitt 2011, 609.)

2.1.2 Towards ecological sanitation

As long as agriculture has existed, human waste has been used as fertilizer. It was not until urbanization of the Western world that sewage systems replaced ecological sanitation which has been since then considered unhygienic (O'Neill 2012b, 12). Now most of the techniques of taking care of sanitation are based either on the thought of 'flush and discharge' or 'drop and store'. The first one is the basic idea in wastewater management especially in the developed world and the latter is common in developing countries, particularly in the rural areas, in the form of pit latrines.

In developing countries it is common that water-based sanitation systems are seen superior compared to the drop and store methods, and many people would like to pursue that 'status'. If the developing countries' national plans on poverty reduction include the importance of sanitation, the plans usually favor flush and discharge systems, Unfortunately, in many parts of the developing world the flush and discharge solutions are too expensive and also unsustainable, considering for example the worsening shortage of water in many areas. It has been seen in the past that when investments on wastewater systems are made in developing countries, they may often be insufficient and consequently waste fresh water and other natural resources and contaminate environment. At this perspective it can be said that inadequate improvements in sanitation systems can be even worse than no improvements at all. (Jewitt 2011, 612–613, 619.)

All in all, "conventional sewage systems, based on flush-toilets, have failed to solve the sanitation needs for developing countries", as stated by United Nations Development Programme. In order to reach the MDG target on sanitation, it would be vital for development practitioners, policy-makers as well as the governments of developing countries to consider cheap, sustainable and locally suitable community-based solutions as an option for flush and discharge systems (Jewitt 2011, 613, 619).

2.2 Principles of ecological sanitation

Ecological sanitation (ecosan) offers an alternative to flush and discharge systems. It can bring a solution to the poor sanitation situation in many areas worldwide but especially in developing countries. Ecological sanitation is a holistic approach towards sanitation and it is based on the idea of nutrient cycle (Figure 3). In ecosan, human urine and faeces and also grey water from households are seen as a resource and not as waste. The aim is to reach ecologically and economically sustainable sanitation situation by closing the local nutrient cycles and returning the nutrients back to the soil. (Langergraber & Muellegger 2005, 435, 441.)

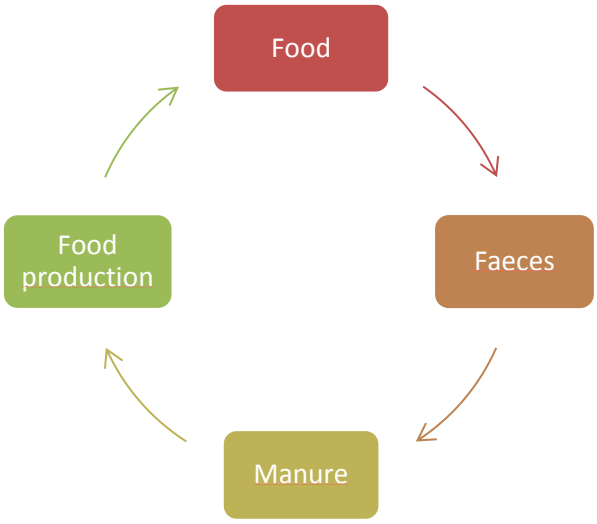


Figure 3. Principle of nutrient cycle, based on a picture by Global Dry Toilet Association of Finland (Huuhtanen & Laukkanen 2009, 7).

In addition to the cycle of nutrients, ecosan aims at minimizing hygienic risks and protecting the environment by preventing excreta from contaminating water sources, food, and environment (Huuhtanen & Laukkanen 2009, 7). In the following chapters different solutions and the benefits of ecological sanitation are discussed.

2.3 Most common ecosan solutions

The technologies and solutions for ecological sanitation are various and should be chosen according to the certain situation, in terms of local culture and preferences. Sanitation solutions should always be

– hygienically safe

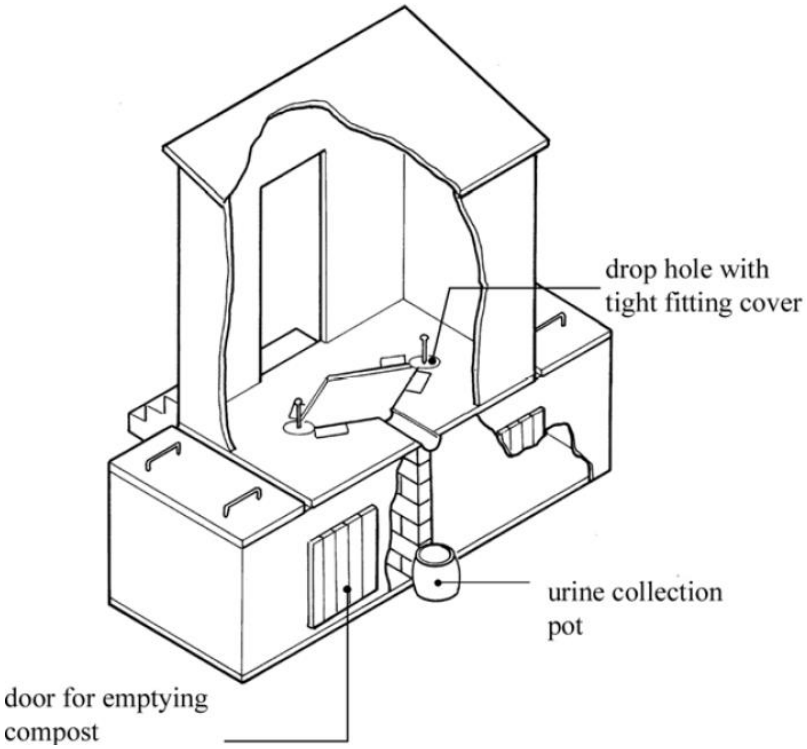
- socially acceptable
- economically feasible
- environmentally sound
- technically appropriate
- convenient to use (Rautanen & Viskari 2006, 7).

A proper sanitation system is always well maintained and prevents the user of the latrine from being in contact with the excreta as well as the community from exposing to the faeces through for example contaminated ground water. Since ecosan is based on the idea of reusing human waste, it is very important to ensure hygiene and proper handling of the excreta. The access of flies and other animals to the excrement should be prevented and the pathogens in the faeces should be made harmless. (Bartram & Cairncross 2010, 4; Huuhtanen & Laukkanen 2009, 22; Langergraber & Muellegger 2005, 438–439.)

There are numerous different ecosan solutions that are all suitable for certain purposes, areas, and cultures. In this study, the focus is on composting methods suitable to be promoted in development projects. Composting toilets are based on the idea that manure, together with or separated from urine, is dried or composted so that it can be used as soil-enrichment material. Different solutions are introduced in the following, without going too deep in the technical details. More information about different latrines can be found for example in *A guide to sanitation and hygiene in developing countries* by Global Dry Toilet Association of Finland.

A **composting latrine** is a type of latrine where the toilet waste is composted or dried and then used as fertilizer and soil enrichment material. In order to improve the decomposing or drying process, to ensure high enough pH to kill pathogens, and to avoid odours, bulking material is added to the toilet after every use. The simplest solution is to dig a **composting pit latrine** that is low enough not to contaminate the ground water. When the pit is full, it is covered and left to decompose. After the decomposing process the material can be dug up and used, or for example a tree can be planted on it. (Huuhtanen & Laukkanen 2009, 26.)

Ecological sanitation is sometimes used as a synonym to dry sanitation, which is a wide-spreading solution based on technologies that do not use water. A **composting dry toilet** is a bit more complex but also more efficient than the composting pit latrine. The dry toilet is not dug but built on top of the ground, usually with two chambers for the compost waste in order to use only one at a time. If there is only one chamber, due to for example a lack of building space, the chamber can be emptied to another place to decompose. The dry toilet is a good solution especially if the soil is too hard for digging or if the ground water level is too high and might be easily contaminated. There are also **urine diverting dry toilets** (UDDTs) where urine is separated from dry waste. This enables also the use of urine as a fertilizer. In these solutions manure is not decomposed but dried for one year. The fertilizer use is discussed more in chapter 2.4.3. One model of UDDT can be seen in picture 1. (Huuhtanen & Laukkanen 2009, 27; Ingle, Berdau, Kleemann & Arndt 2012, 66.)



Picture 1. In this UDDT model manure is collected into two chambers and urine to a container (Harvey, Baghri & Reed 2002, 82).

2.4 Benefits of ecosan

People and environment all over the world can benefit from ecological and dry sanitation in several ways. In developed nations, the well-being of environment is one of the main drivers, but in the developing world the priorities are usually people's health and safety and the general development of communities. In this section the focus will be on the developing countries and especially rural areas, considering the topic of the study and the fact that most of the people who lack proper sanitation live in rural areas (Jewitt 2011, 620). The importance of proper sanitation facilities in urban areas should not be however forgotten or underestimated.

2.4.1 Health

Proper, clean, and safe sanitation conditions can prevent pathogens from getting into water sources and environment. This way, not only diarrhea but also for example intestinal parasitic diseases decrease (Huuhtanen n.d.). These diseases are significant causes of malnutrition which exposes people to other severe diseases. Especially children suffer from many serious problems that are caused by improper sanitation: they can face stunting or cognitional difficulties. The improving of water and sanitation conditions is estimated to be able to reduce child mortality by a third and maternity death rates significantly. According to WHO (2011), daily almost 10,000 people, mostly children and old people, die of diarrhea diseases that could be prevented by providing them with proper sanitation. (Bartram & Cairncross 2010, 1–3, 8; O'Neill 2012b, 14.)

Diseases such as diarrhea can spread very easily especially if the water that is used to get rid of faeces is used also as drinking and washing water, whether it is because of lack of knowledge or lack of any other source of water. Improperly handled human excrement may also facilitate the breeding of parasites and flies that spread diseases. Ecological sanitation is a good solution to avoid these problems: it does not contaminate water sources or lure parasites when the excrement is stored properly. It also prevents people from being in contact with the excrement. There is no evidence that the health benefits of proper sanitation could not be achieved also through dry sanitation. Like any other sanitation system, it just needs to be built and maintained well. (Bartram & Cairncross 2010, 1; Jewitt 2011, 615–616.)

2.4.2 Water and environment

Conventional flush and discharge systems are blamed for wasting fresh, often drinkable water, and in pit latrines the excreta can get in touch with ground water. One of the most obvious advantages that ecological sanitation provides is the saving of water. This enables more water to be used to other important purposes such as agriculture. Also soil's ability to absorb water is improved when compost from toilets is used. Ecosan techniques enable the handling of manure in situ, which means that sewerage systems are not needed and rivers and environment are not polluted by poorly treated wastewater. (Jewitt 2011, 613; Huuhtanen n.d.)

Ecological sanitation has a role also in the fight against climate change. Ecosan solutions decrease the use of nonrenewable energy sources and nutrients, such as phosphorus. Sanitation that does not use any water also eases the adaptation to the influences that climate change will have on the quality and quantity of water sources (Mahato 2012, 125, 134). In addition, a well-being community is more eager to fight against environment problems such as climate change than people who lack basic needs.

2.4.3 Food security and income

Stenström (1997) writes that especially the western sanitation and wastewater management technologies are designed in a way that people do not need to think about or deal with the excreta – it is considered to be waste, not something that could be used (Langergraber & Muellegger 2005, 434). According to UNDP (2008) however, food security and agriculture need the valuable nutrients that are in human excrement and these nutrients are wasted in both conventional sewage systems and pit latrines (Jewitt 2011, 613).

Nutrient cycle is the principle idea of ecosan: in theory, the amount of nutrients that is needed to grow grain to feed one person is approximately the same amount that is in the urine and excrement of the same person (Huuhtanen & Laukkanen 2009, 34). The use of manure is a good way to improve soil fertility and urine contains important nutrients that food crops need. When using fertilizers from ecosan toilets, the dependency on chem-

ical fertilizers reduces as well as their leaking into water sources and the environment (Jewitt 2011, 613). Many studies have proved the efficiency and safety of using human excreta on crops and according to Huuhtanen & Koivisto the best result is achieved if urine and manure are used separately. As long as the storage and other handling of manure is done properly, safety is ensured. Plants should not be over-fertilized and urine is in most cases recommended to be diluted with water. (Huuhtanen & Koivisto n.d.; Huuhtanen, e-mail 30.9.2013.)

Fertilizers from ecosan systems are important not only for food security but also for communities and their income. There are a lot of good experiences from all over the world where communities have benefitted from practically free dry toilet fertilizers and this way generated new sources of income. This has wide effects: most of the 2.5 billion people without proper sanitation are the same 2.5 billion people that live in poverty with less than US$2 per day. In some areas, such as densely populated suburbs or city centers, the using of toilet fertilizers in gardens in a larger scale is not a realistic option. In these areas other ways to collect and utilize the toilet waste should be developed. (Jewitt 2011, 613, 616; Patinet 2012, 120.)

2.4.4 Other social benefits

Improved sanitation can be main factor in increasing school attendance and improving the efficiency of learning. Proper sanitation facilities in schools are important especially for girls and this way they support also gender equality. Besides school-goers, also workers benefit from proper and clean sanitation. When sickness cases reduce there are more resources available for work and the effectiveness of workers increases. This means more income for people and more taxes for the state. Lessening of diseases also lowers the health care expenses. A lot of valuable time is lost if people search for a place to defecate. Time is also saved when a new toilet does not have to be built after it fills up, like it has to be done with pit latrines. Composting dry toilet is a permanent solution. (Bartram & Cairncross 2010, 3; Huuhtanen n.d.)

Although it is mentioned that reduction of health risks is the focus area in developing countries, the emotional and social drivers are also essential. According to Curtis et al. (2009), for instance, it has been discovered that the emotional level in hygiene promoting is very important and can change people's behaviour more likely than rational statements. The things important for people include safety, privacy, and convenience. (Bartram & Cairncross 2010, 7.) In some cultures, for instance, women are allowed to relieve themselves only when it is dark, which exposes them to being bitten by snakes or attacked by other people (Jewitt 2011, 615–616). Convenience is improved by for example odourlessness of dry toilets. The pride and social status that is gained by having a proper toilet should not be underestimated.

All in all, ecological sanitation can improve people's living conditions, safety, food security and health, decrease poverty, better soil fertility, and

increase the safety and well-being of water sources and environment (Jewitt 2011, 614; Langergraber & Muellegger 2005, 442). The improvement of sanitation sector also affects the overall development of rural areas. When water and sanitation situation is developed, it has a positive influence on such things as the financial situation of families and the position of women. (Sillanpää 2012, 27.)

3 DEVELOPMENT PROJECTS

Global development work is strongly directed by the Millennium Development Goals by UN and different actors carry out development cooperation in different ways. Public development work is usually bilateral or multilateral. Bilateral development cooperation is executed together with long-term partner countries that are supported through for example budget or sectorial budget support, programme support, and projects (Ministry for Foreign Affairs of Finland 2013a). In multilateral development cooperation countries' development funding is channeled through international organizations and financial institutions, such as UN and World Bank, that decide on the using of the funds (Ministry for Foreign Affairs of Finland 2013b).

3.1 Non-governmental organizations in development work

One form of executing development work is projects by non-governmental organizations (NGOs). These projects complete public development cooperation with their good, direct contacts to beneficiary countries. Usually NGOs' work can reach people and communities that are unreachable for larger projects. Besides working for the MDGs, NGOs aim at strengthening developing countries' civil society and support the local organizations. The work often focuses on the basic needs of people and communities: education, health, and improved livelihood. (Ministry for Foreign Affairs of Finland 2012a.) According to Schofer et al. (2010), NGOs have essential role in spreading information and new innovations (O'Neill 2012b, 16).

The development work executed by NGOs has developed a lot during a few decades: the providing and construction of for instance schools and boreholes, which was earlier considered efficient, has now been replaced by projects that are based on empowering local communities. This ensures the sustainability of projects and permanence of achieved results. NGOs receive funding from their governments. The European Union also funds projects, and in 2007–2013 approximately 17 billion Euros from EU's external relations budget was allocated to development cooperation. (Kehys ry n.d.)

3.2 What is a project?

Ministry for Foreign Affairs of Finland (2012b, 18) defines a project as "an entity of measures aimed at generating sustainable results with specif-

ic resources, within a given timetable". According to project management consult Risto Pelin, "a project is the work that is done in order to achieve a certain defined result". In other words, the tasks that are done are temporary but the results are meant to last. The project is always well planned with methods that are effective and developed for the purpose. (Pelin 2009, 26–27, 33.)

Objectives of the project have to be determined as well as the ways to achieve them: people's tasks and responsibilities, schedule, budget, needed resources, et cetera. There is always project manager or coordinator who is responsible for the succeeding of the project. Other people working for the project can include employees and consultants. A good project plan includes a definition of communication and its channels and possible risks and problems that the project can face and the ways to prevent these risks. (Pelin 2009, 65, 79, 89, 225, 232, 293.)

The supervision and reporting of the project must also be planned in order to for example keep in schedule and in budget, to perform evaluations, and to make decisions. When the project is finished, a final report and evaluation of whether the objectives were met are made. To execute monitoring and evaluation of the project efficiently, proper indicators have to be defined. (Pelin 2009, 303, 356.)

3.3 Managing a development project

The results of this thesis are made based on experiences from a project by Finnish non-governmental organization and the focus group that is meant to utilize these results are other NGOs. This is why also the focus in the framework and especially in this chapter is on the development projects that are executed by NGOs. These projects are usually supported financially by governments and the EU, which defines the project's requirements. These requirements play an important role in the planning, implementation, monitoring and evaluation of the development project, and they are reflected in the following chapters. Because of this and the fact that it would be quite impossible to map out all countries' policies on this subject, the managing of the development project is looked mainly through the guidelines of the Ministry of Foreign Affairs of Finland.

Development projects are based on things such as capacity building, sustainability, and supporting the existing resources in order to ensure the continuity of the project activities. The local people are not a passive target group of the project but active participants. Projects always exist in a wider perspective, which improves sustainability but also causes challenges when for example cultural aspects need to be recognized well enough. Development workers have to understand local communities' traditions and practices not only on the topic of a certain development project but also in general. Issues such as gender roles are important to take into account in order to carry out the project successfully. (Seppälä & Vainio-Mattila 2000, 10.)

It should be remembered in all development projects that the most important task that development workers have is to make themselves useless (Sillanpää 2012, 27). This means that the results of the project, such as new techniques, knowledge, and attitudes remain in the area after the actual project is finished. This requires good planning and implementation that involve the local people as the project's stakeholders in order to create and improve their ownership of the project.

The development project can be executed in many ways, but the programme cycle presented in Figure 4 is in many cases used as a basis. Its idea is that after every phase of the cycle a decision is made about continuing to the next phase. It is also possible that some phases are repeated or that any phase is interrupted if there is a need for studies or assessments. (Ministry for Foreign Affairs of Finland 1999.) It is important to acknowledge that the actual implementation of the project can start after successful execution of all planning phases. In the following chapters the phases are discussed more.

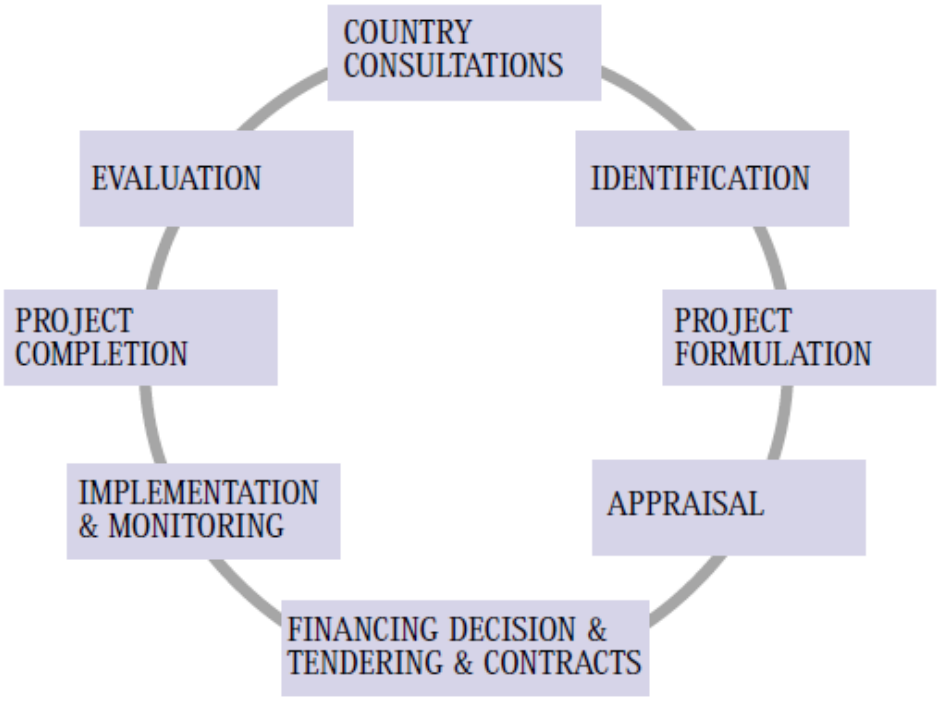


Figure 4. Programme cycle as presented by Seppälä & Vainio-Mattila (2000, 31).

3.3.1 Planning

A development project starts by identifying the most important stakeholders and beneficiaries and setting up a project idea together with them. The other development projects in the area should be mapped out as well as the national development objectives. (Webster 2006, 85; Ministry for Foreign Affairs of Finland 2012b, 19.)

Baseline study

The project planning starts, if possible, with a baseline study. Its aim is to identify the local interests, demands, priorities, and resources and evaluate different options that could improve the situation. First, general and sector-specific studies are made and the stakeholders of the project as well as their needs are identified. After this a more precise analysis is made to define the purpose of the project. Previous studies in the same area are examined. During the baseline study the local political, economic, environmental, social, and cultural situations are identified and analyzed. A supportive policy environment is a vital thing in all projects, which is why it is important to identify the existing political situation. Financial viability and sustainability of the project must be evaluated as well as the project's overall influences on the country's economy. One tool is cost-effectiveness analysis which aims at identifying the most cost-effective ways to achieve the project goals. (Ministry for Foreign Affairs of Finland 1999.)

Socio-cultural analysis is an essential tool to identify the things that are connected with or influenced by the project. Social and cultural aspects contain for example different subcultures and relations between them, values, understanding of ownership and justice, practices, beliefs, religions, and gender roles. Culture should be considered as a positive factor in the project process rather than something that only slows it down. (Ministry for Foreign Affairs of Finland 1999.) Socio-cultural analysis ensures cultural sensitivity and sustainability of the development project and is a good way to integrate into the local culture. According to Seppälä & Vainio-Mattila (2000, 11), if the project lacks cultural sensitivity, it has a big risk to fail. Also, if local culture is not valued and taken into account during planning and implementation of a development project, it can cause not only the failing of a project but also weakening of the local culture (Verhelst 1993, 142). Gender aspects and equality are nowadays seen very important in development work. It must be remembered that gender is a social and cultural concept which determines the roles of men and women and varies in different cultures, locations, and also generations. Gender roles are changing everywhere through the influence of internal and external factors. (Seppälä & Vainio-Mattila 2000, 26.)

Defining the objectives and project strategy

Based on the baseline study, the project is either proved to be justified or unnecessary. In the former case, the next phase is to set the scope and objectives for the project. Well-defined objectives are achievable, aim at improving the existing situation, help the project to succeed, and ensure the sustainability of the project. Project purpose is one specific objective that the project has and it defines the reason and focus of the project.

Project strategy is formed based on the purpose and objectives of the project. Making a relevant and achievable strategy requires compromises and prioritizing. In project strategy the overall objectives, activities, needed resources, external factors, and risks as well as the planned results are stated.

The project strategy also defines for instance the possible need for further, more precise studies on certain topics. Impact assessments need to be made in cross-cutting issues to assess the sustainability of the project. (Ministry for Foreign Affairs of Finland 1999.)

3.3.2 Implementation and sustainability

Based on the objectives and strategy, the actual project actions are planned. Like Pelin stated in chapter 3.2, the ways of reaching the objectives are important to define. This means determining of for example people's tasks and responsibilities, realistic schedule and budget, and the technical details and needed resources. The resources include human resources, materials, equipment, and services. The plan must consider all contextual factors and integrate into the regional development policies. (Ministry for Foreign Affairs of Finland 2012b, 18.)

The **implementation** of development project is done according to the things decided and determined in the planning phase. Projects vary from short- to long-term and from local to national. Also for instance the participation level can alter, but involvement of locals is also recommended. The NGO that is carrying out the project should have a local partner that does most of the implementation in the recipient country. Besides the local partner, the projects should always work in co-operation with for example local authorities. During the implementation, the project plan and its activities are updated regularly and specified considering for example the timing and responsibilities. Implementation should always be well-controlled and scheduled. (Ministry for Foreign Affairs of Finland 1999; Ministry for Foreign Affairs of Finland 2012b, 6, 9; NETTSAF 2008, 12–13.)

Even though development projects are time-limited and unique, their results are supposed to be long-lasting and therefore sustainable. **Sustainability** of development project and all development work generally can be summarized as Ministry for Foreign Affairs of Finland describes: "it [project support] is a temporary shot in the arm with which the partner's resources can be boosted". Development projects aim always at improving the capability of local people, communities, and NGOs to take responsibility for their own development, and the purpose of foreign development aid is only to support this. Sustainability can be ensured by co-operation, participatory methods, creating local people's ownership of the project, and building capacity of the local communities. (Ministry for Foreign Affairs of Finland 2012b, 9–10, 18.)

Sustainability is important to be evaluated in all phases of the project to ensure the continuity of the work (Ministry for Foreign Affairs of Finland 1999). Also an **exit strategy** is vital for the sustainability of every project and it should be included already in the planning phase. Exit strategy ensures that when the actual project withdraws from the area, the full responsibility has been passed to the local people and communities who continue working to improve their lives. Most importantly, development project should not ever create dependence on the donor. To ensure this, the local partner must have an active role and for example seek other sources

of funding. (Global Dry Toilet Association of Finland 2011a; Ministry for Foreign Affairs of Finland 2012b, 10; Webster 2006, 314.)

3.3.3 Participatory methods

Participatory approach in development projects allows the local people to be a part of the project from the beginning to the end and ensures local's ownership of the project. Participation increases effectiveness and enables people to determine their own lives and also learn from each other. In the past, many so called 'top-down' projects have failed due to their inability to involve and commit local people to the projects and their results (Jewitt 2011, 616). According to Webster (2006), one role of participatory methods is to aim at reducing the power distance between stakeholders. This is based on Webster's studies in Ethiopia and Uganda where it was noticed that the chance of dependence is bigger when a high power distance exists (Webster 2006, 252).

The aim is that people whose life the project influences have the possibility to take part in decision-making in all phases of the project. After all, local people know the best their own potential and limitations (Ministry for Foreign Affairs of Finland 1999). Basic principles of participatory approach in development projects are respecting local people's knowledge, skills and values, improving the situation of minorities, and trusting in democracy. (Laitinen 2002, 18–19, 25.) The participation of local people should start already when setting objectives of the project. This succeeds when the development needs are found out together with the locals, taking the needs of for example minorities and genders into account (Sillanpää 2012, 27).

One well-known participatory approach is Participatory Rural Appraisal (PRA). It involves locals to collect, control, analyze, and use information for development projects. One of the main goals of PRA is to empower people to make decision about their own issues and to strengthen communities. Because Participatory Rural Appraisal was planned to focus on projects in rural areas, nowadays it can be indicated in general as Participatory Learning and Action (PLA). (Laitinen 2002, 29–30.)

PRA is usually divided into three topics: attitudes and behaviour, sharing, and methods. The attitudes and behaviour section emphasizes the respectful attitude that development workers must have towards local people and their culture. Both sides can teach the things they know the best and learn from each other. The sharing of information is of course important: reporting has to be done effectively and in a way that everyone who participates in the project understands it. Since PRA is not one certain method but a range of different methods, they should be used variedly in order to see different sides of the issues and to support communities' participation in planning, analyzing, and discussions. Used methods should be visual, demonstrative and familiar to all participants. (Laitinen 2002, 29, 31.)

3.3.4 Monitoring

The monitoring of the project is planned as well as the ones who are responsible for it (NETTSAF 2008, 16–17). Monitoring is done continuously throughout the project and is based on the planned objectives, activities, and results. It is a tool to follow progress – the successes and failures – and to make changes in the project in order to reach the objectives more efficiently. The achieving of results can be monitored by comparing the achieved results to those that were planned. (Ministry for Foreign Affairs of Finland 1999.) Participatory monitoring and evaluation enables beneficiaries of the project to develop indicators that measure the project results in their point of view (Mutamba 2010a, 15).

Well-defined and measurable objectives and indicators are requirements for proper monitoring process and the criteria should be the same throughout the whole project. Indicators can be both qualitative and quantitative and their aim is to measure for instance the progress of change, effectiveness, and efficiency as well as achieving of the overall objectives and planned results. They help the project management to be aware of what happens during all phases of the project and provide information for reliable monitoring and evaluation. It is important to set the indicators in the stakeholders' point of view in order to find out the project's impacts on their lives. In addition, the ways of following the indicators during the project have to be defined.

The progress of the project is reported regularly based on the monitoring, usually four times a year. Also annual monitoring reports are made in order to follow and report such overall aspects as sustainability. Monitoring reports focus on beneficiaries' views while progress reports can be from the management team's perspective. However, it is vital that the project management is objective and reports also possible failures. Financial reports are usually written quarterly together with the progress reports. (Ministry for Foreign Affairs of Finland 1999.)

3.3.5 Evaluation

The Network on Development Evaluation of OECD's Development Assistance Committee (DAC) has set guiding principles for development project evaluation. They were published in 1992 and give general directions for development workers to carry out the evaluation process. DAC emphasizes transparency and co-operation as well as neutrality and independency of the evaluator. This ensures credibility and legitimacy. (OECD DAC Network on Development Evaluation 2010, 7–8.)

According to DAC, evaluation is "systematic and objective assessment of an on-going or completed project – –, its design, implementation and results". Analyzing focuses on achieving of objectives and the effectiveness of the project actions as well as the impacts and sustainability of the project. (OECD DAC Network on Development Evaluation 2010, 4.) It is also very important to evaluate the long-term influences of development aid

and to use this information in future projects (Suoheimo & Uusikylä 2011, 163).

Even today the evaluation of a development project is sometimes seen only as a tool for reporting the donor whether the goals were achieved or not. A better scenario is that it is used also to learn from the project. According to M. Quinn Patton, the quality of made evaluation can be measured by its usefulness in developing the evaluated action. Both the donor and the beneficiaries can learn from the project and develop their policies and projects (OECD DAC Network on Development Evaluation 2010, 4, 7). Also the guide by Ministry of Foreign Affairs of Finland (1999) claims that the made evaluation is being wasted if it does not cause changes in organizational behaviour. Evaluation is in the best case made in co-operation with the ones who utilize the results. (Suoheimo & Uusikylä 2011, 159.)

4 ECOSAN IN INTERNATIONAL DEVELOPMENT WORK

In addition to UN for example European Union, that gives over half of the world's development aid, emphasizes sanitation in its development activities. Its water and sanitation sector acts based on the policies and priorities for EU's development cooperation on water management. EU's water and sanitation development programmes are supported annually with almost 1.5 billion Euros. EU also launched The European Water Initiative in 2002 in order to reach the MDG on water and sanitation and to support the development of developing countries' national water and sanitation strategies and increase the funding of this sector. (European Commission 2013; European Court of Auditors 2012, 8.) In addition, EU emphasizes the need for innovative solutions in the water and sanitation sector of development work, and ecosan is a good example of this. Ecosan systems are said to enable adjustability of projects. (COM (02) 132 final, 17, 19.) The development policies of EU define the policies of its member countries, such as Finland. In Finland's Development Policy Programme sanitation is together with clean drinking water seen as a part of sustainable management of natural resources and environmental protection. This topic is promoted in several ways, of which one is "strengthening the rights-based approach for water supply, sanitation and hygiene". (Finland's Development Policy Programme 2012, 38–39.)

As it can be noticed from the international guidelines, sanitation goes almost always hand in hand with water issues. This is why sanitation development projects also often include water into the project, or vice versa. Even if the main focus is on sanitation, the connection to clean water and hygiene should be emphasizes during the whole project.

4.1 Managing an ecosan project

The planning and implementation of an ecological sanitation development project, as well as all development projects, can be challenging and must include tools that ensure sustainability and effectiveness of the project. No matter how well developed a sanitation system is, it is always a challenge

to apply it to different conditions. Many studies have proved that the two main reasons for not achieving sustainability in ecosan projects are technical problems and lack of ownership. (Rautanen & Viskari 2006, 6–7.) As mentioned, ecosan is rather a holistic approach and attitude than a certain method or technology that should be used in every project and location. The right ways to execute ecologically and economically sustainable sanitation should be weighed each time to the specific location. Some features however apply to almost all ecosan projects. The involvement of the stakeholders is always vital, which requires participatory planning and decision-making as well as providing enough information to the beneficiaries and other stakeholders. (Langergraber & Muellegger 2005, 436.) In the following the international principles and special features of ecosan project management are discussed based on the development project phases introduced in chapter 3.3 and a guide by Network for the development of Sustainable Approaches for large scale implementation of Sanitation in Africa (NETSSAF), a project supported by the European Commission.

Every project starts with recognizing the beneficiaries and their needs, as already mentioned. The will to develop local sanitation situation may differ between the authorities and the local people. It is vital that both of these levels are motivated and have the need to participate in the project. The demand for improved ecological sanitation services can be achieved by awareness raising and providing the local people with information about suitable sanitation solutions and their benefits. The demand creation will continue throughout the whole project. (NETSSAF 2008, 4–7.) According to Paju (2008), knowledge about for example excrement-related health risks plays a vital part in people's attitude towards dry sanitation, but when acquiring a dry toilet, other factors than knowledge are involved. They are for example convenience, need for privacy, and improved safety of especially women and children. Also the emotional benefits such as the rising of family's living standard and social status are worth sympathizing. Convenience applies to the usefulness of the new toilet facility promoted by the project: people will not invest their time and money to a new sanitation system and its maintenance if it is too unpleasant or difficult to use or if old habits such as open defecation seem easier and cheaper solutions. The prevention of health risks is more commonly in the interest of communities than single people or households. According to UNICEF, one of the most important things to be examined in this field is what things provide the circumstances in which people, regardless of geographical and cultural aspects, are motivated and able to change their sanitation practices. (Bartram & Cairncross 2010, 7; Jewitt 2011, 615–617, 620; Langergraber & Muellegger 2005, 436.)

In order to create a goal that all stakeholders feel motivated to work for, a sanitation planning team can be established to collect together sanitation experts, facilitators, and representatives from stakeholder groups. The next step in the planning process is to conduct a baseline study in order to find out the existing sanitation situation and the requirements, needs, and resources for new sanitation systems. The information about local conditions, legal framework and political situation and people's capacity as well as institutional, technical, and financial capacity are examined and evalu-

ated. This background information is collected from for example users of new toilets, farmers, and local authorities. (NETSSAF 2008, 4–5, 8–9.) In socio-cultural analysis the people's values, attitudes, and beliefs that concern for example the using of human excreta are examined. In sanitation projects especially the gender questions are very important because women and men benefit in different ways from improved sanitation situation and, according to van Wijk-Sijbesma (1995), they also have different needs when it comes to sanitation. These issues are taken into account the best if both men and women are involved in the project. (Langergraber & Muellegger 2005, 436.)

After identification of the existing situation and the needs that beneficiaries have, the most suitable sanitation system for the certain project is identified. First the possible alternatives are identified, evaluated and piloted, and finally the most suitable option is chosen. Estimation of costs and availability of different materials and tools affect the decision. The sanitation planning team combines one plan for the implementation of the sanitation project. When planning the implementation, things such as use of cost-sharing methods in construction of sanitation facilities can be weighed. (NETSSAF 2008, 10–13.) The actual technical implementation, meaning constructing of sanitation facilities, is led by local sanitation experts and engineers. According to Jenni Koivisto, project coordinator of a dry sanitation project in Swaziland, the people to whom the new sanitation facilities are for should always take part in the building of the toilets (Valve 2010, 83). This way the people feel that the toilets are their own and the sustainability of the project is ensured. One small but very important thing in implementation of sanitation projects in developing countries is the seasonality: rainy seasons usually make the building of toilets and supplying of materials difficult (Kar 2011, 215). The whole chain of dry sanitation should be planned and there should be a way to utilize the gained toilet fertilizers. In some projects local people may use the fertilizers but in other projects they can be collected and utilized by enterprises and farmers. The implementation includes also sharing of information through for example workshops, drama performances, posters, and media. When people are well involved and participate in decision-making, the awareness rising also brings better results. (Huuhtanen 2012, 60.)

Developing the sanitation sector in developing countries' local and national governments is important. The development projects should notice this and focus resources to support for example the developing of legislation. (Sillanpää 2012, 27.) Development of the national legislation throughout the whole sanitation chain and in co-operation with different stakeholders is important and supports the local government and people as well as the local NGOs working with these issues. In the field of ecological sanitation, the issue that legislation often concerns is the agricultural using of excreta. In developing countries the legislation on this topic can be nonexistent or it can in some cases even forbid the use of human excreta. These kinds of things have to be found out before establishing an ecosan project. Especially when talking about large-scale using of excreta, the quality and hygiene control and some kind of certifications could be considered. WHO has set guidelines for safe use of wastewater, excreta, and grey wa-

ter in agriculture and aquaculture, and these guidelines can be used when the local legal framework is missing. (Gensch, Dagerskog, van Veenhuizen, Winker & Drechsel 2012, 5.)

4.2 Cultural sensitivity

Our western attitude towards human excreta has come a long way from the time when it was seen as an important fertilizer in agriculture. Still, some types of ecological sanitation solutions have been in use around the world, like in Asia, for centuries (Langergraber & Muellegger 2005, 436). Though cultural attitudes towards human excreta vary over time and space, the cultures can be roughly divided into two categories: those that tolerate the handling of excreta (*faecophilic*) and those that see it improper or even offensive (*faecophobic*). Sanitation development projects attempt to influence on these values, attitudes, traditions and habits that are very deep in many cultures. This is why it is essential that project has cultural sensitivity from the beginning to the end. (Jewitt 2011, 611–612.)

Many researches highlight the need for sanitation approaches that are sensitive enough to local culture when it comes to for example use of human excrement. Santosh and Monti (2010) have listed three cultural factors which should be noticed in order to understand the social aspects of sanitation. They are psychological constrains that prevent handling of human manure, social factors such as gender roles, and the influence of religions. (Munala 2012, 42.) In some cases the taboos to use or even talk about human excreta are very deep and can even prevent the development of more effective and sustainable sanitation systems and cause difficulties for projects that promote these solutions. It is important not to forget the status that flush toilets have and the fact that unused people may have difficulties with using for example urine diverting toilets. (Jewitt 2011, 609–610, 614.)

4.3 Participatory methods

Problem in many sanitation development projects has been that the constructed toilets have been left without any maintenance or use after the project. To prevent this, the responsibilities have to be defined clearly during the project and long-term benefits of dry toilets have to be acknowledged by beneficiaries. (Global Dry Toilet Association of Finland 2006; Global Dry Toilet Association of Finland 2008.) After the importance of sanitation sector projects has been noticed globally, a few participatory methods have been developed to meet the requirements that sanitation development projects have. In the following two of them are introduced briefly.

4.3.1 Community-led total sanitation

Community-led total sanitation (CLTS) was developed by Kamal Kar in development projects in South Asia and leans on PRA methods. With the help of CLTS communities can examine their sanitation conditions and

become aware of their problems. The aim of this approach is not to build new kind of toilets or teach people what to do, but rather to achieve a change in the community's sanitation habits – a change that rises from people's own understanding and motivation. Total sanitation consists of

- stopping all open defecation
- ensuring that everyone uses a hygienic toilet
- washing hands with soap
- handling food and water in a hygienic way
- disposing animal and domestic waste safely to create a clean and safe environment. (Kar & Chambers 2008, 8.)

During the CLTS process people are brought together to make collective decisions on their sanitation, health, and environment and to take responsibility of community's issues. The driver to make decisions and actions is internal motivation to improve the community. Social solidarity, help, and co-operation are the key factors in CLTS and it has an effect on everyone who lives in or visits the community. As mentioned, one aspect is to stop open defecation. Stopping open defecation and cleaning of surroundings are seen as the first important step towards the behaviour change that CLTS aims at. After achieving this first goal, the community is often eager to set and reach new common goals, for example that every child in the community should attend school. (Kar & Chambers 2008, 8–9.)

During the last decade, CLTS has resulted in thousands built low-cost toilets mainly in Asia and Africa. The toilets have been constructed by local people and out of local materials. The stopping of open defecation and being proud of toilets have influenced people significantly, providing them with not only health benefits but also freedom from shame when the privacy of defecation is improved. All in all, the positive impacts of CLTS on for example health issues have been documented especially in Asia, and the potential for similar results in other areas has been recognized widely. (Mehta 2011, 1; Musyoki 2011, 219–220.)

4.3.2 Participatory hygiene and sanitation transformation

Participatory hygiene and sanitation transformation (PHAST) is a water and sanitation approach developed by WHO and used also in the work of UNDP and World Bank. This program aims at strengthening communities to develop their livelihoods and encouraging them to participate in hygiene and sanitation projects. The key element is awareness rising about hygiene, water and sanitation and their close relationship. The process of empowerment is seen to be as vital as the actual building of for example dry toilets. (Lienert n.d.)

PHAST is based on participatory methodology called SARAR, which promotes self-esteem, associative strengths, resourcefulness, action planning, and responsibility. PHAST consists of steps that use participatory tools enabling local people to be involved in the planning and implementation, to take part in decision-making, and to gain confidence. The steps include

- problem identification and analysis
- planning for solutions and selecting options
- planning for implementation and behaviour change
- planning for monitoring and evaluation
- participatory evaluation. (Huuhtanen & Laukkanen 2009, 43; Lienert n.d.; The World Bank n.d.)

5 THE PURPOSE AND EXECUTION OF THE STUDY

This study was made based on experiences from the Zambia Sanitation Project (ZASP) which is a pilot project by Global Dry Toilet Association of Finland (GDTF) in rural Zambia. The results of the study support a target of ZASP to build an operation model for these kinds of projects. They also go hand in hand with the recommendation by Ministry for Foreign Affairs of Finland that best practices ought to be shared among development work providers "for the purpose of achieving synergies between the various actors" (Ministry for Foreign Affairs of Finland 2012b, 9).

5.1 Global Dry Toilet Association of Finland

The thesis was commissioned by a Finnish NGO Global Dry Toilet Association of Finland. It promotes sustainable and dry sanitation both in Finland and worldwide. GDTF was founded in 2002 to meet the need for dry sanitation information in Finland and to work for dry sanitation and the natural nutritional cycle (Huuhtanen, panel discussion 25.5.2013). The organization's vision is to "make dry toilets an essential part of sustainable development, thus securing clean waters and a healthy environment for future generations". This is done for example by collecting and sharing information about dry sanitation, developing new dry sanitation solutions, participating in research, and making public statements about dry sanitation. (Global Dry Toilet Association of Finland n.d.a.) In addition to the promoting work that GDTF does in Finland, it participates in global events and has organized international dry toilet conferences.

Soon after the founding of GDTF, it was noticed that information about sustainable sanitation is needed also in developing countries (Huuhtanen, panel discussion 25.5.2013). Thus an important part of GDTF's activities is development work. Like global development cooperation in general, also the development projects of GDTF are based on the UN Millennium Development Goals. GDTF has surveyed the necessity of sanitation projects and found out that they are quite rare in Finnish development work. (Global Dry Toilet Association of Finland 2006.)

All the development projects of GDTF are supported by the Ministry for Foreign Affairs of Finland and but also by NGO's own funds. In the past, GDTF has had projects in Karelian area in Russia. Currently it has three development projects that take place in Zambia and Swaziland:

- Zambia Sanitation Project (ZASP) is located in Luansobe in rural Zambia. The project started in 2006 and will be finished in 2013. The

aim of the project is to improve the sanitation situation, build dry toilets, and provide education and training in the area.

- In 2008 started the Lusaka dry sanitation development project. It takes place in Madimba which is a suburb in the capital city of Zambia. This project's goal is to improve sanitation and water supply, provide households with dry latrine solutions, and organize education. The Lusaka project is due to end in 2013.
- The project in Swaziland is located in a slum of the capital city, Mbabane. The Msunduza dry sanitation project started in 2007 and improves the poor sanitation situation in the slum by building toilets and providing education. The project is executed in co-operation with Turku University of Applied Sciences. The project will finish in 2013 but more funding for a similar project has been applied for. (Huuhtanen, e-mail 23.9.2013; Global Dry Toilet Association of Finland n.d.b.)

5.2 Objectives and scope of the study

The purpose of this study was to collect, combine and analyze information in order to find out the best ways to carry out a development project that focuses on ecological sanitation. The results are presented as a guide that gives useful information for GDTF and other NGOs that execute ecosan projects. To reach these objectives, information from different sources was combined and analyzed. The main source of information was the Zambia Sanitation Project by GDTF which was studied in order to find answers to the following questions:

- How was the project planned and implemented? What was successful, what was not?
- What are the main results of the project? Were the set goals achieved?
- What actions and methods proved to be good?
- What are the practices that guarantee the results of the project to be long-lasting and sustainable?
- How could these experiences and information be used in other similar projects?

The emphasis was on the three last questions that provide useful information and help the study to reach its objectives. The question about sustainability was added after a wish by GDTF to in particular focus on project sustainability and how to ensure it.

The thesis was done for GDTF the goal of which was to get as much usable information from its pilot project ZASP as possible. In this point of view the objective of the study was to provide GDTF with a guide that could be utilized in its future projects and offered to other NGOs that execute ecosan development projects. According to the project manager, it is not possible to make a certain operating model for dry sanitation projects since when copying it to a new project area the local culture is not taken into account properly (Kettunen 2013, 8). Hence, the purpose of this study was not to create a step-by-step guide but to collect examples and practices that have been proven efficient. One objective was to provide GDTF with useful information for the evaluation of ZASP that is conducted at the

end of 2013. Since the project is finished at the end of 2013 and this thesis was made during the same year, it is unfortunate that the final evaluation and establishing an exit strategy could not be examined in this study.

The scope of the study followed the structure that theoretical framework in earlier chapters has presented: the focus was on the planning and managing of ecosan development projects executed by NGOs. Although the ZASP case is located in sub-Saharan Africa, the outcome of the study gives as general information on the subject as possible so that NGOs working in for example Asia or Southern America could also benefit from it. Although the topic is ecological sanitation, the focus was on the dry and composting sanitation system. Also the projects executed in rural areas had a bigger role in this study than those in urban areas, such as slums. These things were due to the nature of ZASP which is introduced better in chapter 6. One objective of ZASP was to improve the water situation in the project area but this topic was also left with a less attention in order to focus properly on sanitation. A few students have made their theses or project works for ZASP before and some of these studies have had a similar topic to this one. This study was however executed in a wider perspective with an aim to provide GDTF with a guide that can be utilized efficiently in the future.

5.3 Research methods

The principles of case study were applied into this thesis since it is a good tool to get a holistic view of a certain case. Case study is rather a manner of an approach than a specific study method. A case is always studied in its real context, taking the temporal, political, economic, social, and cultural aspects into account (Saarela-Kinnunen & Eskola 2010, 192). The researcher is a neutral observer who is not supposed to make any changes to the studied case. To ensure reliability, work is represented and documented in a way that the process becomes clear to the reader. According to King et al. (1994), it is extremely important to report how the used data has been collected and how the researcher got it (Swanborn 2010, 17). Case study combines different techniques such as interviews, observations, and documents – therefore the study can have both qualitative and quantitative features. A strategy that uses various methods is called triangulation. Tuominen and Sarajärvi (2009) describe the four main types of triangulation which are based on a theory by Denzin (1978). Two of these are applied in case studies: material triangulation uses different material sources in one study and method triangulation uses several ways of data collection to gain the study material. Method triangulation can still be divided into two subclasses: within-method and across-method. The latter was relevant in this particular study and it means that information from the certain case is collected with different research methods, not different variations of the same method like in within-method study. (Tuomi & Sarajärvi 2009, 144–145; Kananen 2012, 34–37.)

Unlike qualitative research usually, the main goal of case study is not to provide information that could be generalized into practice. However, the general representativeness of the results – or rather the lack of it – is con-

sidered to be a problem in case studies. (Kananen 2012, 36.) To increase the objectivity of the study, theory about the topic as well as similar researches can be examined. An analytic approach to the study is also a condition to the generalization, as well as the clear enough description of the research process, as mentioned above. According to Eskola and Suoranta (1998), the generalizations are usually best to be made based on the conclusions that are made from the study. (Saarela-Kinnunen & Eskola 2010, 190, 194.)

By using case study as a research method, a complete and objective picture of ZASP could be formed. However, this study did not match entirely to the requirements of a case study because the approach was different than usually in case studies: the studied case, ZASP, was determined first and only after that more specified research questions and the study method were defined. As mentioned, a case study contains various different information collection methods. In this study, the most relevant technique was describing and analyzing documents from ZASP and identifying the most usable methods of ecosan development project planning and management. In addition, similar projects were represented in order to complete the experiences of ZASP. This gained material from different projects was combined with general development project theory that is discussed in the earlier part of this report. A common problem in case studies is that it is difficult to generalize the results and prove them to be reliable. This is why it was important to reflect the results with the theoretical framework. Finally, the results of the study were used to develop the guide of best practices.

The material that was used in the case study is provided mostly by GDTF. Over 30 documents were analyzed in the study: project plans for each three project phases, mid-term and final evaluations, annual reports, progress reports, field visit and monitoring reports that were made a few times a year, workshop reports, and studies and other reports made by Finnish students. The project plans were made by project manager, the monitoring and evaluation reports and most of progress and field visit reports by outside consultant, and progress and some of the workshop and progress reports also by local field coordinator. Especially the project plans and evaluations were prepared for the Ministry for Foreign Affairs of Finland and therefore their purpose has been of course to give a realistic image of the project but also to ensure funding for the project. This may have affected the evaluations and was acknowledged during the study by analyzing the material as critically as possible. One source of information was the Finnish project manager of GDTF who was interviewed via e-mail due to long distance and scheduling. The results were also mirrored to the author's own volunteering experiences from the project area. This helped to be critical about the reported results of the project. However these experiences were used only to view the research materials critically, not to provide any information for the study.

6 CASE: ZAMBIA SANITATION PROJECT

According to the Joint Monitoring Programme for Water supply and Sanitation by WHO and UNICEF, 48 percent of people in Zambia had proper sanitation in 2010. The situation is a bit worse in rural than in urban areas. The government of Zambia has established a National Rural Water supply and Sanitation Programme to increase the number of people who have access to adequate water sources and sanitation and to reach the MDGs. Zambia has also a national goal that everyone living in the country would have proper sanitation and water situation by the year 2030. (Huuhtanen 2012, 51.)

Zambia Sanitation Project (ZASP) in rural Zambia is the first project of GDTF in sub-Saharan Africa and its role is to be a pilot project for GDTF's future activities in developing countries. ZASP is meant to focus more on for example the commitment of beneficiaries than sanitation project usually do. (Global Dry Toilet Association of Finland 2006.) The people in rural Zambia are poor and may have the interest but not the ways to improve their sanitation situation (Global Dry Toilet Association of Finland 2011a). In this chapter ZASP is introduced from baseline study to evaluation of results. The information is presented as it was found in reports and studies made by and for the project and as it could be the easiest to utilize in achieving the objectives of this study.

6.1 The project area

ZASP was implemented in Luansobe that is located in Masaiti district of the Copperbelt Province in the central part of the country (Picture 2). The project region consists of 12 main villages and the total area is about 260 km^2 (Huuhtanen & Juusela 2008, 11).

Picture 2. The project area is located in the Copperbelt province of Zambia (Mutamba 2007, 9).

There are about 12,000 inhabitants and most of them get their living from agriculture and from burning and selling of charcoal. People have however quite varying socioeconomic situations (Global Dry Toilet Association of Finland 2006; Leppänen 2012). Families are relatively poor and the education and literacy levels are quite low. People in the area are exposed to many diseases such as malaria, diarrhea, typhoid, and cholera, and there appears some malnutrition, especially qualitative. (Global Dry Toilet Association of Finland 2011a.)

The center of the project area, Kaloko, has gotten its name from a local NGO Kaloko Trust Zambia. For example the Luansobe Basic School, kindergarten, Kaloko health center, market place, and the office of Kaloko Trust are located there. In the whole project area there are many small and three larger schools, of which Luansobe is the largest one with even 1,300 pupils. Two other schools worth mentioning are in Kandulwe and Kamabaya with 300–400 pupils. There are also a couple of small schools with 100–200 pupils and even smaller local schools that do not have professional teachers. While the main clinic is located in Kaloko, in other villages there are health outposts where people hold so called 'under-5 clinics' that collect the villagers together about once a month. The busiest marketplace of the area is at the Mpongwe Junction which is located at a crossroads by a highway from the capital city Lusaka to Ndola, the second largest city of Zambia. From this junction starts a road to city of Mpongwe, and the project area is located by this road. There are two marketplaces by the Mpongwe road: one at the Kaloko Junction and one in Kantolo. It is common though that people sell their farm products by the roadside. Maize can also be sold to the government's Food Reserve Agency. (Huuhtanen, e-mail 23.9.2013.)

6.2 Planning of ZASP

The story of ZASP began in 1999 when the project's current manager did her practical training in Kaloko studying the water situation. She noticed a lack of proper sanitation possibilities in the area. The project implementation started in 2006 with funding from the Ministry for Foreign Affairs of Finland. The project was continued in three phases until 2013, even though the activities were first planned to last until the year 2014. Each of these three phases of ZASP was planned separately with focus on different things, but the overall objectives stayed the same throughout the whole project. In each plan, the key stakeholders, partners, and responsibilities were identified and timetables made (Mutamba 2007, 21).

6.2.1 Objectives and planning process

The main objectives of the project were to reach long-time improvements in the local sanitation situation. This was planned to be done by providing people of the project area information about hygienic sanitation methods so that they gained confidence to take responsibility for these issues. Proper sanitation systems were to be built in the area and people were encouraged to build their own toilets. One objective was to examine the use of

toilet fertilizer in the area. (Global Dry Toilet Association of Finland 2006; Global Dry Toilet Association of Finland 2011a.)

The long-term development targets were to:
- reduce illnesses and save human lives
- increase equality
- manage the whole chain from the dry toilet to the re-inducement of nutrients in the fields
- support local business
- improve the state of the environment, save and protect water resources
- improve all in all the quality of life
- achieve the Millennium Development Goals of the UN (Global Dry Toilet Association of Finland 2006).

Planned results of ZASP included
- wholesome drinking water supply in the project area
- dry toilets with hand-washing possibility in public places
- dry toilets for disabled people
- dry toilets and gardens for households
- repaired pit latrines
- people's improved knowledge about sanitation and hygiene
- community capacity building (Global Dry Toilet Association of Finland 2008).

One of the main ideas of ZASP was that since sanitation is connected to cultural beliefs that often cannot be changed in the means of traditional education, new ways and techniques are needed to execute sanitation projects in a sustainable way. The project developed new ways to make the benefits of dry sanitation understood and to educate sanitation and hygiene issues to local people. Techniques to build toilets in a way that is not only easy and inexpensive but also sustainable and proper for the local culture were developed. (Global Dry Toilet Association of Finland 2006; Global Dry Toilet Association of Finland 2008.)

In the first phase of the project the main objective was to increase local people's consciousness and knowledge of sanitation and hygiene issues. In addition, the building of toilets started. In phase two, the targets included providing the communities with safe water sources and sanitation solutions, increasing the fertilizer use of toilet waste, and increasing people's commitment and participation. During phase three the activities aimed at building communities' capacity to take responsibility for the project, making an exit strategy, and ensuring sustainability of the project in general. Education and construction of toilets especially for households continued as well as encouraging people to use toilet fertilizers. (Global Dry Toilet Association of Finland 2008; Global Dry Toilet Association of Finland 2011a.)

The planning of ZASP was done based on the findings of baseline study and the information from local stakeholders. For instance, the locations of communal dry toilets were decided together with local people (Global Dry Toilet Association of Finland 2010, 8). The local culture and traditions

and especially the needs of beneficiaries were taken into account during the planning. The basic idea throughout the project was to increase people's understanding on sanitation issues and to make it as easy as possible for them to build, use, and maintain the toilets and to use the toilet fertilizers. (Global Dry Toilet Association of Finland 2006.)

6.2.2 Identifying beneficiaries and risks

During planning, the beneficiaries of the project were identified. There are approximately 10,000 inhabitants in the project area and most of them were estimated to benefit either directly or indirectly from the project through education, workshops, sanitation clubs, dry toilets, and boreholes. With the help of the project, people get improved health and hygiene situation, convenient sanitation solutions, better security especially for women and children, and cleaner environment. The role of toilet fertilizers is also important since the area of Luansobe suffers from poor nutrient levels, droughts, and erosion, and chemical fertilizers are expensive. (Global Dry Toilet Association of Finland 2006; Global Dry Toilet Association of Finland 2008.)

In addition to the local people, the project also identified other, indirect beneficiaries. They included GDTF and other organizations that gain useful information from this pilot project as well as all the people taking part in the project, such as Kaloko Trust Zambia and its staff, Green Living Movement, and Kaloko health centre. Also the Finnish students who do their practical training or final thesis for the project can be seen as beneficiaries (Global Dry Toilet Association of Finland 2006; Global Dry Toilet Association of Finland 2010, 6). Government and the whole nation also benefit indirectly by improved health and better possibilities of people to study and work.

Possible risks were estimated during the planning of each phase and they included for example difficulties with work schedule, communication, cooperation, responsibilities, and economic problems. If any problems are faced, the project team deals with them right away. The building of toilets has its own risks of for instance the availability, delivery and quality of materials, and the level of construction knowledge. The built toilets might not work as wished – a risk that can be minimized by building a pilot toilet and testing it in practice in the local conditions, and after that educating people to maintain the toilets properly. One of the biggest risks concerns the commitment of local people: if it fails, the whole project fails. (Global Dry Toilet Association of Finland 2006.)

6.2.3 Roles and responsibilities

The responsibilities of ZASP can be divided into three levels, as can be seen in table 1. The administrative level, consisting of GDTF and its board, was responsible for administrating the project and making the biggest decisions. The International Group of GDTF board followed and assessed the project and its progress. The project manager of GDTF was re-

sponsible for the implementation, monitoring and evaluation of ZASP and also reporting about the project to the Ministry of Foreign Affairs of Finland and to the board of GDTF. (Mutamba 2008, 9; Mutamba 2012a, 9.) The decisions that were made concerning the project and use of financial resources must have her approval (Global Dry Toilet Association of Finland 2008; Global Dry Toilet Association of Finland 2011b, 18).

Table 1. Three level management structure of ZASP.

Administrative level	GDTF board Project manager
Local management level	Kaloko Trust management Local field coordinator
Community level	Communities

Baseline study and project planning were conducted by project manager together with local partner Kaloko Trust Zambia (KTZ). Kaloko Trust Zambia is an UK-based organization which gets its funding from Kaloko Trust UK. The NGO has worked in the area since 1995 with a long-term goal to relieve poverty and raise livelihoods. This is done by supporting healthcare and education, developing local agriculture and other sources of income, and encouraging people to use natural resources in a sustainable way. The work of KTZ is based on so called self-help projects on subjects like agriculture, food security, water management, health and education, and local enterprise development. (Kaloko Trust UK n.d.) KTZ was chosen to be GDTF's local partner after the current project manager of ZASP had got familiarized with the projects of KTZ in 1999. This co-operation was ideal since KTZ has a long experience and credibility in the area as well as a good understanding on local people's lives. The local partner acted as an adviser and a source of information. The director of KTZ reported project details and possible problems to the project manager and also communicated to local people about the project. He was also responsible for keeping in contact with the local project field coordinator. (Global Dry Toilet Association of Finland 2006.) KTZ provided housing for Finnish workers and volunteers when they visited the project area, as well as transportation and interpreter when needed (Global Dry Toilet Association of Finland 2010, 7).

The local field coordinator started working for ZASP in 2007 when it was noticed that there was a gap in communication between GDTF and ZASP and that effectiveness was needed in project management in the second level. The tasks of the local field coordinator included managing the community activities, such as training, research, and construction of toilets, as well as reporting about the project to the project manager. The actual implementation in the field was under the responsibility of the local field coordinator and KTZ (Global Dry Toilet Association of Finland 2010, 6). In implementation, the project manager was a contact person between GDTF and Zambia and visited the project area regularly. Management team met regularly to ensure mutual goal in the planning and implementation phases. (Mutamba 2007, 18, 20.) Good communication and trust between the local field coordinator and the project manager was vital for the project (Lepaus 2010, 5).

The local communities of the project area formed the community level of management. Local people's participation in the project and its activities grew throughout the project with a goal to involve them in decision-making and make them committed to ZASP. Opinions were gathered in discussions with local people and reference groups. Eventually, after the toilets were taken into use and people were educated to use and maintain them and also to use the fertilizers, the aim was that locals would take full responsibility for the toilets and their maintenance. The project management would then act only in the background and help locals to define for example the maintenance responsibilities. Even after this the project requires follow-up in order to ensure the sustainability. (Global Dry Toilet Association of Finland 2006.)

6.2.4 Co-operation with other partners

All important decisions made in the communities go through the eldest of the villages. There is also one main chief of the whole area. The management of ZASP met with the Chief Mistress who, as well as other local leaders, has supported the project. Also the official local district authorities expressed their support to the project. The opinion of these kinds of leaders is important for a project that promotes new innovations and tries to change people's attitudes. (Global Dry Toilet Association of Finland 2008; Global Dry Toilet Association of Finland 2011b, 7.)

The aim of development projects is to improve the situation not only locally but also in a higher level. During ZASP the national state of sanitation was studied with a conclusion that the situation is "unbalanced, yet improving". The water and sanitation issues are involved in the tasks of several ministries so no-one has a full responsibility of them. Co-operation is increased between different stakeholders, which enables the development of national policies. ZASP did not work directly with the government but with district officials through the co-operation with Kaloko health center that works for the district. Kaloko health centre gave hygiene education in co-operation with the local field coordinator and promoted sanitation issues in the area. They also provided ZASP with information and statistics about the health situation and diseases in the project area. (Global Dry Toilet Association of Finland 2010, 4–5; Global Dry Toilet Association of Finland 2011a; Huuhtanen, e-mail 23.9.2013.)

Many local people such as local teachers, parents, and people in the clinic played an important role in the project. They were met regularly and the project was planned together with them. Co-operation with other NGOs was important since GDTF is a relatively small organization. KTZ was the biggest co-operation partner but another Zambian NGO, Green Living Movement (GLM), had a central role in the project as well. Emmanuel Mutamba from GLM has good experience in working with local people in environmental issues, and he made several project evaluations and acted as facilitator in ZASP workshops. (Katambo 2009, 3; Global Dry Toilet Association of Finland 2008.) Co-operation was done also with Finnish universities. Many students of for example environmental engineering made their practical training or final thesis for ZASP. This co-operation

offered students an opportunity to learn about international development work and to share their skills with ZASP (Mutamba 2012a, 9).

6.2.5 Baseline study

As mentioned, the first phase of the project started in 2006 based on the findings of a water survey conducted in 1999. This water survey examined the water sources in the area and included a simple risk analysis about the impacts that for example erosion, sanitation and the use of fertilizers have on the water sources. The survey was made by interviewing almost all households in the area. The results showed that only 10 percent of the people in the area got their water from boreholes, and that there were no composting toilets in the villages and only few proper toilets in general. (Global Dry Toilet Association of Finland 2006; Mutamba 2007, 4.)

The goal of the first project year was to collect as much information as possible from the project area and develop an operational model for the project. The baseline study consisted of interviews that were carried out by Finnish students and the local partner. The information was gathered from village areas and for example the clinic (Global Dry Toilet Association of Finland 2010, 9). The focus in the interview was on:

- the state of sanitation
- water supply and sanitation methods
- effect of the local culture (gender roles, traditions) on toilets
- the use of composting toilets in the area
- sanitation and hygiene education level
- hygiene practices and illnesses
- partners in co-operation.

Information was collected also from literature and previous studies. One important thing was to find out which areas need toilets the most. (Huuhtanen & Juusela 2008, 13; Global Dry Toilet Association of Finland 2006.)

It was discovered that the water situation in the area was quite poor: people fetched their water from open shallow wells that are exposed to contamination and from rivers that do not have enough water during dry season. An average distance to the water source was 0.9 km and for some families even 5 km. (Global Dry Toilet Association of Finland 2006; Käymäläseura Huussi ry 2013.) The quality of water sources was studied in 2007 by examining total coliforms, E.coli, and bacteria from well and stream samples. It was discovered that there was a widespread bacteriological contamination in waters used by households and that both the quantity and quality of water were big challenges. (Pulkkinen 2007, 3, 7.)

Sanitation in the project area was also insufficient since people used pit latrines, open pits, or bushes to relieve themselves. These conditions caused many difficulties, such as water quality and quantity problems, health and hygiene problems, diseases, infant mortality, and pollution of environment and water sources. (Global Dry Toilet Association of Finland 2008.) People however had good knowledge on hygiene, water, and sanitation but

this knowledge was not used in practice. During the baseline study it occurred that many people in the area had prejudices towards handling of human waste and the using of it for agricultural purposes. Some people associated these kinds of activities with witchcraft. Also the participation level of the local communities was not very high in these kinds of community projects. (Global Dry Toilet Association of Finland 2006; Kettunen 2013, 12; Mutamba 2007, 5.)

6.2.6 Cultural sensitivity

When an outside NGO comes to a developing country to work in a strange culture, cultural clashes are likely to be faced. In order to avoid these clashes, the GDTF had familiarized itself with the local culture and took the culture into account in all phases of the project. The Finnish people who came to work to the project area were trained before their arrival. The cultural aspects that should be noticed do not concern only the differences between local and Finnish people but also for instance the gender roles. ZASP guaranteed the noticing of gender issues by educating both male and female and ensuring gender balance in all activities during the project. In villages education was given to men and women also separately to discuss the subject from their different viewpoints (Global Dry Toilet Association of Finland 2006). Dry toilets were built to schools, markets, and other public places, which created safety for women and girls to relieve themselves. This was especially important in the schools where lack of proper sanitation may disturb girls' studying. (Global Dry Toilet Association of Finland 2010, 10.)

6.3 Implementation

After the baseline study and planning, the carrying out of the project started in 2007 and 2008. This stage included negotiations and written agreements with local partner and companies, construction of pilot toilets, and giving guidance on the use and management of the toilets and education on hygiene. (Global Dry Toilet Association of Finland 2006.) After that, the actual construction of toilets and awareness rising through education began.

During the planning of phase two the improvement of water sources were included to the project following a suggestion by local partners. ZASP planned to drill boreholes, install hand-pumps, repair existing water sources, form water committees to ensure maintenance of water sources, and educate locals to use, maintain and repair them (Global Dry Toilet Association of Finland 2008; Global Dry Toilet Association of Finland 2010, 7). The topic of water sources is referred to in some parts of this study but a more precise introduction of this topic was left out in order to concentrate on sanitation.

A need for a vehicle for ZASP was identified in 2008. Communities are located far from each other and the project management, especially the local field coordinator, should be able to visit the communities. In the first

phase the project management failed to attend meetings in several communities, which caused frustration among local people. (Mutamba 2008, 14.) Ability to visit the communities regularly was essential also in order to educate people and to monitor the project. The local field coordinator used a bike for a while to visit the villages but it was not sufficient since the longest distances are even 60 kilometers. A vehicle was bought finally in June 2012. This enhanced not only monitoring of the project and organizing education events in communities but also transporting construction materials. (Katambo 2010a, 6; Katambo 2012, 9.)

6.3.1 Education and training

Awareness rising through education was a vital part of ZASP. Education was planned with an aim to give people information about the importance of hygiene and proper sanitation and to achieve a change in their beliefs and attitudes especially towards the use of toilet waste as fertilizer. The local people naturally wanted to gain information about the construction, use and maintenance of dry toilets as well as the costs of these kinds of investments. (Global Dry Toilet Association of Finland 2006; Mutamba 2007, 12, 25.) There were strong traditional beliefs and stigmatization towards sanitation and especially the handling of human excrement, but it has been observed that these kinds of beliefs can be changed over time with right education and a trusting environment (Mutamba 2008, 17; Mentula 2008, 92).

Education and trainings were conducted until the end of the project and the different topics of education were introduced step by step. The most important thing was that education was practical and people could see and participate. Existing information channels were used when giving education: for instance the under-5 clinics that are held in health outposts in the villages were a good channel to reach mothers. (Kettunen 2013, 10.) During years 2006–2011 approximately 8,000 people participated in different education and training events in schools, Kaloko clinic, and health outposts (Global Dry Toilet Association of Finland 2010, 6).

Local people's knowledge and awareness were studied already in the beginning of the education: in progress report made in 2007 it was noticed that all communities understood their bad sanitation situation, and in survey made by Kamoto Community Arts in 2007 it was found out that people had good knowledge of for example water-borne diseases but only 20 percent of people applied this knowledge into practice. This was taken into account later in ZASP by ensuring that the learnt things were brought to the practices in the every-day life of local people. (Kamoto Community Arts 2007.)

Education

Education was given at school to pupils and in communities to local people mainly in form of workshops. In workshops education was done by sharing knowledge and finding solutions together (Katambo 2012, 8). Education to local people was given in following topics:

- hygiene and health
- building and using of dry toilets
- using dry toilet waste as fertilizer
- leadership skills and project management (Global Dry Toilet Association of Finland 2008).

Hygiene education started during the first phase and continued throughout the project. For example during the second phase of the project hygiene education, sensitization and trainings were given monthly by Kaloko health center and local project manager in the schools, clinic, and health outposts. The education sessions were open to everyone and during them people were able to discuss, ask questions, and tell their opinions. The project's aim was that as many people as possible would attend the education meetings and workshops. (Global Dry Toilet Association of Finland 2006; Global Dry Toilet Association of Finland 2008; Global Dry Toilet Association of Finland 2010, 2.) Schools were seen as an important way for spreading information to the whole community and the co-operation with local teachers was important (Mutamba 2007, 13).

Awareness rising and education about sanitation have a key role in ecosan projects, especially if the aim is to introduce entirely new innovations in the area. After building the first toilets it became relevant to educate people to use the toilets and to use the toilet fertilizers. Safety in storing and handling of dry toilet waste was emphasized throughout the project, as well as the difference between excrement and compost (Kettunen 2013, 12). The dry toilets that were built first had an important role in raising locals' interest and awareness. Also the positive experiences from test fields were vital since they helped people to see the benefits of dry toilet fertilizers. The role of gossiping should not be underestimated: in 2008 it was studied that besides hygiene and sanitation trainings, other members of communities were the most important source of information on dry toilets. (Global Dry Toilet Association of Finland 2008; Mutamba 2007, 12, 23; Paju 2008, 47–48.)

The role of education about community capacity building, including skills on leadership, community mobilization, conflict management, motivating and fundraising, grew towards the end of ZASP. Gaining of these skills is required in order to succeed in project implementation and to achieve sustainability and community's ownership of the project. (Mutamba 2008, 6, 12, 16.) The education sessions focused for instance on developing communities' skills in action planning in order to have more well-planned activities that support the project (Katambo 2012, 4).

Training and other actions

The training of builders to construct dry toilets started when the first pilot toilet was built by work-based training of a local builder who would then train new builders. By the year 2013 over 10 builders were trained. (Kettunen 2013, 10.) All members of sanitation clubs and those attending the workshops were trained to maintain and repair the toilets. ZASP trained also the users of water sources to use, maintain, and fix the hand-

pumps and boreholes. This is a good example of participatory training: Each village had a one-day practical workshop where people could learn hand-pump maintenance and use of tools. They also participated in repairing of old boreholes. (Mutamba 2010a, 3, 9.)

During the first project year 18 people were trained to be voluntary sanitation experts. They were from different parts of the project area and their task was to spread information about sanitation in their villages. Most of these 18 experts were later very active in ZASP and the sanitation clubs. (Global Dry Toilet Association of Finland 2008; Huuhtanen, e-mail 23.9.2013.)

Kamoto Community Arts from Lusaka did drama performances and knowledge sharing sessions in the area in May 2007 to sensitize locals about sanitation and dry toilets. According to the progress report made in 2007, the performances and learning sessions committed new local people to the project (Mutamba 2007, 13). Another good motivator during the project was community visits. For example during phase two ZASP organized a visit to successful projects by GLM in Serenje in Central Zambia. 16 people from the most active sanitation clubs attended the trip. The visit was described positive and inspiring and it encouraged people to work better as a group. (Global Dry Toilet Association of Finland 2010, 2, 11.) In the project area the communities were also encouraged to visit each other and to share experiences. It was recommended during the project that ZASP should carry out awareness campaigns by producing for example posters. Education material was provided to the clubs. (Huuhtanen, e-mail 23.9.2013; Mutamba 2008, 9.)

6.3.2 Building and maintaining of the toilets

The toilet model that was decided to present in ZASP was a urine diverting dry toilet with two chambers for manure and a container for urine. The opinions of local users were taken into account when developing the design of toilets and the result was a model that meets both the set standards and the requirements of local conditions. The built toilets were of different sizes while the most important thing was that they were safe and hygienic and easy for locals to use, maintain and repair. Built toilets also always had hand-washing devices. (Global Dry Toilet Association of Finland 2008; Global Dry Toilet Association of Finland 2011a; Huuhtanen 2012, 54; Mutamba 2008, 8–9.) In the beginning of the project in 2007 at first one pilot toilet was built and then one in each village to get experiences of the local conditions. The locations of pilot toilets were decided with the local partner and inhabitants. (Global Dry Toilet Association of Finland 2006; Global Dry Toilet Association of Finland 2010, 10; Kettunen 2013, 10, 15.)

One goal of ZASP was to involve locals in the construction of the toilets. Local materials were also used as much as possible in the toilets. Unfortunately the original plan to use grass and hay for the roof and bamboo for ventilation pipe did not work out well. This is why for example iron sheets and plastic ventilation pipes had to be transported from nearest towns.

This added to the costs of toilets but at the same time made the toilets more permanent. The building of a public model can cost up to 1,000 Euros and the low-cost model for households about 200 Euros. (Huuhtanen, e-mail 23.9.2013.)

Public toilets

The construction of public toilets continued during all project phases and between the years 2007–2011 altogether 28 public toilets were built (Mutamba 2012a, 13). Each community had at least one toilet in their area. There were many qualified bricklayers who took part in the construction of the toilets (Mutamba 2007, 15, 22). The need for communal sanitation clubs that would maintain the toilets was noticed in progress evaluation in 2007, and 9 clubs were formed in a leadership skills workshop in January 2008. In the last phase of the project there were 12 clubs of which 10 were active (Huuhtanen, e-mail 23.9.2013). Each sanitation club agreed who is responsible for maintaining their dry toilet. The role of sanitation clubs is discussed more in the chapter 6.4 about participatory methods.

Household toilets

After the first public dry toilets were built, local people were interested to build own toilets. The community dry toilet model by ZASP would have been too expensive for households and it was suggested that the project could build a low-cost dry toilet as a model for locals. Hence, one of the targets of phase two was that people would start to build household toilets. (Mutamba 2008, 15; Global Dry Toilet Association of Finland 2008.) The design of the low-cost model was finished in July 2010 after some delays and its aim was to be as sustainable, suitable for the local users, and economically affordable as possible (Global Dry Toilet Association of Finland 2010, 2; Huuhtanen 2012, 60).

When building the household toilets, a cost-sharing method was implemented. The families had to collect the needed materials, such as sand, stones and burned bricks, while ZASP provided cement and labor for the base of the toilet (Global Dry Toilet Association of Finland 2010, 6, 8; Katambo 2010b, 12). After that it was under the families' responsibility to finish the toilets with walls and roof. The walls could be built from cement and roof from iron sheets. It was possible to use grass, hay or reeds as well if other materials were too expensive (Leppänen 2012). In August 2011 it was decided that ZASP would provide ventilation pipes and roof sheets to the owners of household toilets in order to make the construction of toilet quicker. In 2011 it was also decided that the families could use clay to the base of the toilet instead of cement if they had financial problems. (Katambo 2012, 5–6.)

The people interested in building a household toilet were both members and non-members of sanitation clubs. According to a study conducted in 2012 by Leppänen, they were engaged in farming. The main reason for many people to get a dry toilet was fertilizer use and its financial benefits, but also for example the permanence of dry toilets compared to pit la-

trines. Obviously those with better financial situation were more eager to invest in their own dry toilet, but it was discovered that also "the people with lower income wanted to make the investment for a dry toilet, in the hope that they would not spend money on the commercial fertilizers anymore and that they would eventually get back the money from using the fertilizers". It can be however questioned whether the toilets could reach the poorest families in the project area. (Global Dry Toilet Association of Finland 2010, 8; Global Dry Toilet Association of Finland 2011b, 2; Leppänen 2012.)

By September 2013 the number of constructed household toilets was 46, out of which 30 were completed, 10 had their base finished, and 6 had base under construction (Huuhtanen, e-mail 30.9.2013). Most of the people who had started to build a low-cost toilet said that the task of maintaining and cleaning the toilet would be done by everyone in the family (Leppänen 2012; Katambo 2012, 5–6). As Finnish student Mia Lepaus recommends (2010, 9), the household toilets could be owned, used and maintained together by a few households.

Schools

Schools are good places to organize workshops for the communities and of course to give pupils sanitation and hygiene education (Global Dry Toilet Association of Finland 2008). Education about these matters is vital in order to keep the built public toilets clean and well maintained, but also to make children think positively about dry sanitation and the importance of hygiene. This message reaches the pupils most efficiently if the school has a garden where dry toilet fertilizers are applied. However especially younger pupils may not understand how to use dry toilets, which is why in some schools in the project area this problem was solved by restricting the use only for older pupils (Mutamba 2010b, 7). There are about 3,000 pupils in the schools of the project area and over 1,000 pupils in the largest school, Luansobe Basic School.

The need for proper toilets in Luansobe and pupils' dormitories is huge. This is why especially at the beginning of ZASP the aim was to build dry toilets there. (Global Dry Toilet Association of Finland 2006.) Altogether four toilets were built: one for girls and one for boys at the school, one for girls at the dormitory, and one for school staff. There was also a sanitation club founded to maintain the built toilets. In 2010 it was however reported that the toilets at the school were not properly maintained. According to local students and teachers this happened because of the location of the toilets: it is too open considering that in the local culture it is shameful to go to toilet if somebody sees it. On the other hand, the locations of these toilets were decided by the people at school. (Huuhtanen, e-mail 23.9.2013; Huuhtanen, e-mail 30.9.2013; Lepaus 2010, 7; Palokangas 2010.)

Many efforts were made during the project to improve the situation at the school. Meetings were held and action plans were made with teachers. Education was provided in many occasions by Finnish volunteers and the

local field coordinator. In 2011 the responsibility for cleaning of the toilets was divided to classes and the toilets were checked weekly, which was said to be working well (Mäkipää 2011, 2). This however did not appear to be a long-lasting practice. The problem seemed to be a lack of follow-up and also motivation: when the teachers promised to educate pupils to use dry toilets, it should have been monitored by ZASP and some kind of reward could have been provided. (Lepaus 2010, 7–9.) One challenge was also a lack of continuity: there were always new teachers and pupils coming in who did not know how to use the dry toilets. Also the headmaster changed during the project and the new headmaster had only little time and interest for the project. According to the project manager of ZASP, the biggest problem in Luansobe Basic School was that although the pupils were well aware of the project and dry sanitation, the teachers and especially the headmaster did not have any interest in the topic. This lack of interest of management level reflects to all people at the school. (Huuhtanen, e-mail 23.9.2013; Huuhtanen, e-mail 30.9.2013; Mutamba 2011, 13.)

ZASP provided dry toilets also to the smaller schools in Kandulwe, Kamabaya, and Kwesha. In these locations the toilets were taken into use at least on some level. Kamabaya school is a good example of this: they have an orchard with banana trees that are fertilized with urine from the toilets, and the grown bananas are given to pupils, which besides of being a good snack also provides them with good experience of nutrient cycle (Katambo 2012, 7). It was suggested that all the schools in the project area should make dry toilet management plans so that the problems of management could be avoided in the future (Palokangas 2010). It would be vital to have at least one teacher in each school who is interested and committed to ZASP and who would be in charge of the toilet maintenance and fertilizer use. More effective sensitization was also needed and one way to execute it could be school drama groups. (Mutamba 2011, 14.)

Disabled people

In the project plan for the second phase it is stated that ZASP would work in co-operation with disabled people in the project area in order to design a dry toilet model accessible for them. Co-operation with Zambia National Association of Persons with Physical Disabilities was discussed. These plans were however buried during phase two due to a lack of need in the project area. (Global Dry Toilet Association of Finland 2008; Global Dry Toilet Association of Finland 2010, 8.) In project plan of phase three the topic was brought into discussion again with plans to develop a toilet model which is accessible for disabled people. The planning would be done by GDTF and other development NGOs. This plan was not fulfilled. GDTF will however continue working for this subject with Finnish NGOs that have disability programmes. (Global Dry Toilet Association of Finland 2011a; Huuhtanen, e-mail 23.9.2013.)

6.3.3 Use of toilet fertilizers

In a study made in 2007 it was found out that people in the project area have a need for low-input agricultural alternatives that also increase soil fertility. Soil nutrient levels are poor and some areas suffer from strong erosion and droughts. For instance, according to a progress report made in 2008, people have had a poor harvest due to inability to buy synthetic fertilizers. (Mutamba 2007, 13; Mutamba 2008, 8; Global Dry Toilet Association of Finland 2008.)

During the first project phase in 2007–2008 a study was made to test urine as fertilizer. The results demonstrated the potential that urine has and showed locals that it can be used as a considerable fertilizer. This was a good way to demonstrate the actual benefits of dry toilets and nutrient cycle to people. (Hännilä 2008, 15, 33.) After getting experiences from the test field, the use of toilet fertilizer and soil-enrichment material was promoted to locals and especially to the sanitation clubs. Having a demonstration field in every sanitation club was important in order to allow the people to see the benefits of the dry toilet fertilizers. A bigger demonstration garden was planned to be established in Kaloko to spread information about fertilizer use. Proper education was of course needed to avoid misuse of toilet fertilizers, which can lead to health problems or loss of yield (Global Dry Toilet Association of Finland 2008; Kettunen 2013, 14; Mutamba 2012b, 6).

In the beginning of phase two the sanitation clubs planned gardening projects that could attract new people to join the project. Almost all of the clubs had test fields or gardens by the year 2010, growing maize, sweet potatoes, cabbage, tomatoes, et cetera. Clubs brought vegetables grown in test fields to workshops for sale and for other people to try. For the first years only urine was available for fertilizer use because the toilet chambers filled up so slowly with manure and even after that it has to dry for at least a year. The applying of manure started eventually in 2012. (Global Dry Toilet Association of Finland 2011b, 16; Katambo 2009, 4, 6; Katambo 2012, 7.)

The household toilet owners had good attitude towards the use of toilet fertilizers although some of them were a bit doubtful at first. Some of them had gained information from the project, some elsewhere, and some had tested it themselves in sanitation club demonstration fields. During the last phase of the project the households started to use toilet fertilizers (Huuhtanen, e-mail 30.9.2013). Their expectations from this included saving money or gaining income and getting better yields than with commercial fertilizers. It depended on the size of farm and the using level of dry toilet whether the household toilets were estimated to provide enough manure to fully substitute commercial fertilizers. (Leppänen 2012.)

An interview was conducted in 2012 with the Food Reserve Agency which buys maize for the government. According to the interviewee, the government is not aware that some farmers use urine and manure from toilets as fertilizer for maize. The government does not necessarily support it but does not see it relevant if the quality of maize is good. However, if the

use of toilet fertilizers increases, it would be good for all sides to consult the government about this topic. The possibility to get certification of organic farming and get access to organic markets should not be ruled out either. (Leppänen 2012.)

6.4 Participation of local people

ZASP worked hard to improve people's participation level by sanitation clubs, education, and different workshops (Global Dry Toilet Association of Finland 2008). There were actually not enough money in the original budget for workshops and other participatory activities, which was revised soon when the importance of participatory methods was noticed in 2009. The local people appreciated the partaking and experience sharing approach of ZASP but were sometimes unable to fully see how important role they had in the project and its sustainability. (Mutamba 2009, 6.)

6.4.1 The role of sanitation clubs

As mentioned earlier, one vital thing in committing people to the project was the sanitation clubs founded in the villages. Their aim was that people would take responsibility for their communities' sanitation and hygiene issues, that their participation, leadership skills and ownership of the project would develop, and that sanitation issues would be promoted more in the communities. (Global Dry Toilet Association of Finland 2008; Global Dry Toilet Association of Finland 2010, 5.)

The sanitation clubs can be joined by any local who is interested in the project, and every club has chairperson, secretary and treasurer. The clubs have small membership fees that are paid annually and the number of members varied from only a few members to even over 40. After formation the clubs made action plans and ZASP paid each of them an initial funding to implement these plans. (Mutamba 2008, 6–7.) Clubs can have different kinds of activities to achieve project goals, such as demonstration fields, education, drama performances, and fundraising (Global Dry Toilet Association of Finland 2008). They raise funds mainly through growing and selling of vegetables grown with dry toilet fertilizer, but also for instance by burning charcoal which is very common but unsustainable way to create income. Education among the clubs has to be constant especially if new members join. One way to motivate the clubs was to arrange exchange visits between the communities and to schedule them a certain date when they would have a meeting to solve their possible issues (Katambo 2011). The clubs made by-laws that defined for example penalties for not attending meetings without proper reason (Mutamba 2012c, 3).

The sanitation clubs were met regularly by ZASP management to discuss their progress. The clubs were encouraged to report their meetings, payments, et cetera to the local field coordinator and also to inform the project management about any challenges they face. (Global Dry Toilet Association of Finland 2010, 8–9.) Feedback forms were developed to ease communication and improve club management. These forms included water

fund card for recording contributions to water funds, club membership register, and financial and meeting report forms. The sanitation club members described the forms to be easy to fill. (Mutamba 2010a, 13.) The water committees were introduced during phase two to be responsible for the boreholes and their maintenance and to raise funds for spare parts and repairing. These committees, having 3–11 members, worked mainly under the sanitation clubs. (Global Dry Toilet Association of Finland 2011a; Lönnblad 2010, 18.)

The commitment level varied a lot between the clubs: some were very active and motivated to manage the club, toilets and demonstration fields, some had only few active members, and some were not active at all despite ZASP's efforts to activate them. Those clubs that were not committed enough were monitored more closely and if there was not any development they were excluded from ZASP. By the end of the second project phase, four clubs had been suspended from ZASP because of their poor performance and encouraged to either re-organize themselves or join other, functioning clubs. It was suggested in 2012 that the clubs that are struggling the most could be given a small support in order to strengthen them. (Katambo 2010b, 14; Leppänen, Piirilä & Töykkälä 2012, 30; Mutamba 2012b, 4, 6.) The factors that led to successful activity of clubs were for example good leadership, committed members, and effective fundraising. During the last phase of ZASP the commitment level in all sanitation clubs was attempted to increase so that they could take over the responsibility for all the activities. In 2011 a strong suggestion was made that those people who had started to build household toilets but were not members of sanitation clubs should be encouraged to join the clubs in order to strengthen them. (Global Dry Toilet Association of Finland 2011b, 20; Mutamba 2012a, 15.)

An idea to form a central committee to strengthen the work of sanitation clubs came from the club members after the field visit to Serenje. The central committee was formed in 2010 and it consists of three representatives from each sanitation clubs. Each clubs paid an affiliation fee of approximately seven Euros to the central committee and also annual membership fees. The central committee meets once a month and has its own by-laws. The main role of the committee is to monitor the project activities and ease communication between communities and the project management. (Global Dry Toilet Association of Finland 2010, 2, 11; Mutamba 2012a, 10.) Central committee encourages people to be involved in the project, spreads information about dry sanitation solutions, and plans different projects. It can also visit the communities, solve problems that the sanitation clubs are facing, and give the clubs tasks. Soon after its formation the central committee visited the communities to let them know why the committee was established and why it makes visits to villages. (Katambo 2010c, 2–3, 7; Katambo 2011.) During ZASP the central committee planned to establish a bigger demonstration garden to the Kaloko center in order to show local people how toilet fertilizers are benefitted from. There was also a suggestion that the central committee could organize field days annually. (Mutamba 2012b, 5–6.) One recommendation was that central committee could hold learning and sharing meetings a few times a year in order to

keep people active and support weaker clubs. All in all the central committee has proved to act as an umbrella for sanitation clubs and its role is vital to sustain and strengthen all activities of ZASP. (Global Dry Toilet Association of Finland 2011b, 20; Katambo 2012, 6.)

6.4.2 Other participatory methods

In addition to the sanitation clubs, ZASP used many methods to increase the participation level in the project. Many of these methods were based on the principles of PHAST (Huuhtanen 2012, 55). Education sessions were always participatory, leaving room for discussion. For example in a workshop May 2012 the action plan developing process was introduced to the members of sanitation clubs and after that the clubs made action plans first to the central committee and then to each club (Mutamba 2012c, 4). The workshops focusing on capacity building, leadership skills et cetera aimed particularly at boosting the participation of local people. Participatory project planning was conducted for instance by organizing a workshop in the beginning of the third project phase to brainstorm with project participants about their expectation and own goals for the last project phase (Mutamba 2012b, 7).

All the toilets were constructed together with local builders using mainly local materials. Work-based training was used to educate the builders. (Global Dry Toilet Association of Finland 2010, 6.) The training days held in the communities focusing on the maintenance and repairing of hand-pumps is a good example of participating local people. After learning about the tools, local people participated in opening the hand-pump and removing and learning about the components, and then putting the parts back together. The participants were able to discuss and ask questions about hand-pumps. (Mutamba 2010a, 4.)

6.5 Sustainability and exit strategy

The sanitation clubs, water committees and the central committee played a vital part in project's sustainability with a purpose that they take the responsibility for the project activities after year 2013. Kaloko Trust Zambia naturally stays in the area and will take a guiding role after the project has finished. District level was encouraged to take water and sanitation to their programmes. (Global Dry Toilet Association of Finland 2011a.)

The most important activities that were conducted throughout the project to ensure sustainability of ZASP were

- sensitization of local people as well as village and district leaders about the project issues
- development of a toilet model suitable for the project area
- participatory education on using, maintaining and repairing of toilets and water sources
- formation of sanitation clubs and central committee that take responsibility of the project activities

- education on capacity building, project management, leadership skills, community mobilization, fundraising, et cetera
- construction of household toilets in a way that locals have to pay a part of the toilet
- showing the benefits gained from ecological sanitation solutions: safety and hygiene, permanent structure, lack of smell, free fertilizer.

In the beginning of 2012 a workshop was held to discuss the last phase of the project. There the sanitation clubs were encouraged to set own goals and "become innovative so that they remained not only in existence but stronger after the end of the project in 2013". (Mutamba 2012b, 7.) Sustainability strategy was made and responsibilities discussed with KTZ (Global Dry Toilet Association of Finland 2011a).

Unfortunately the exit strategy cannot be used in this study since it has not been finished or tested at the time of finishing the thesis process. However it can be said that community capacity building executed during the project supports the implementation of the exit strategy that will pass the responsibility slowly to the beneficiaries (Mutamba 2008, 6; Kettunen 2013, 15). Central committee also plays an important part in the exit strategy of ZASP (Mutamba 2012c, 3). The exit strategy will be tested in practice in order to find out how the sanitation clubs, water committees, local people, and KTZ can sustain the project (Global Dry Toilet Association of Finland 2011a).

6.6 Monitoring and evaluation

The issues examined in the baseline study, such as the state of sanitation and education level, were monitored during the project and also in the final evaluation (Global Dry Toilet Association of Finland 2006). The other used indicators are listed in 6.6.3.

6.6.1 Monitoring and evaluations

Monitoring was done throughout the project. The aim of monitoring was to map out the opportunities and challenges of ZASP, strengthen community participation, assess made activities, and discuss with local about desired improvements (Mutamba 2009, 2; Katambo 2010b, 6). The findings of monitoring were used to develop the project and emphasis was given to the views of local people (Mutamba 2007, 23). The idea of monitoring the project follows the principles of PDCA model of Deming: Plan, Do, Check, Act (Huuhtanen, e-mail 3.10.2013).

The project manager visited the area 2–3 times a year during the whole project. During these follow-up visits she had meetings with the local field coordinator and KTZ, visited communities to discuss with local people, and gave education to the sanitation clubs and central committee. (Global Dry Toilet Association of Finland 2011a.) Otherwise she monitored the project by communicating with the local field coordinator who made annually several project progress reports and other documents that included

information about main findings of the implementation. A few monitoring reports were annually made by a consultant Emmanuel Mutamba from GLM. As outside consultant he had an important role in monitoring the project. He used participatory methods such as interviews and group discussions. Other methods he used were SWOT analysis, literature reviews, and general observation. Cost-effectiveness of the project was assessed continuously during the project. (Mutamba 2007; Mutamba 2012a, 8, 16.) It was also suggested that the whole local management team should start having monthly project assessment meetings (Mutamba 2012b, 5).

Mid-term evaluations as well as project evaluations after each phase were made also by Mutamba. The focus of project evaluations was on assessing the implemented project activities and main achievements as well as challenges. The evaluations emphasized the cross-cutting themes of Finnish development aid and focused especially on the administration and implementation of ZASP and for instance the situation of low-cost dry toilet models. The participatory methods introduced in previous chapter were also utilized when making these evaluations. (Mutamba 2012a, 8.) The final evaluation of the whole project will be made in November 2013 (Huuhtanen, e-mail 30.9.2013).

6.6.2 Used indicators

The data that was collected in monitoring and evaluations focused on the sanitation situation, use of built toilets, illnesses in the area documented by local clinic, water situation, effect of local culture (e.g. gender roles, local traditions and beliefs), and given education.

Quantitative data that was collected included:

- number of built toilets, number of people using them
- number of schools that have a toilet, number of pupils using them
- number of given hand-washing devices
- number of drilled boreholes and installed hand-pumps
- number of repaired water sources
- number of sanitation clubs and water committees and their members
- number of fundraising events
- number of founded test plots
- number of education events (e.g. workshops) and their participants
- number of people with knowledge to construct dry toilets
- number of people with knowledge to repair hand-pumps
- number of produced campaign material
- number of beneficiaries (Global Dry Toilet Association of Finland 2008; Global Dry Toilet Association of Finland 2011a).

Qualitative data that was collected included local people's experiences from the project, people's opinions and suggestions, and made reports. In 2011 a detailed event list was taken into use to improve collection of qualitative data. The monitoring of awareness rising was a difficult task and reliable results on for instance project acceptance are hard to provide. Also other indicators such as conservativeness, cultural values, traditions, cus-

toms, leadership, and personal benefits have to be taken into account. (Global Dry Toilet Association of Finland 2008; Global Dry Toilet Association of Finland 2011b, 18; Mutamba 2007, 14.)

6.7 Results of the project

All in all, during its implementation years 2006–2013 ZASP has raised awareness on sanitation and water issues, constructed public and household toilets, provided and repaired water sources, and provided knowledge and skills on dry toilet maintenance, fertilizer use and capacity building. The communities of the project area seemed to slowly accept the concept of dry sanitation and nutrient cycle, and the demand for dry toilets and water sources outweighed the project capacity to provide them (Global Dry Toilet Association of Finland 2010, 6). During the project, altogether 28 public toilets and 46 household toilets were constructed. Still, a lot of challenges were faced during the project.

6.7.1 Successes

The demand for dry toilets increased a lot during the project and new sanitation clubs were formed, which tells that awareness rising had succeeded at least on some level. According to a study by Leppänen (2012), people's attitude towards dry sanitation changed to positive after they heard good experiences from others and saw the results. In 2011 it was reported that education has decreased the stigmatization significantly. (Global Dry Toilet Association of Finland 2011b, 2, 14; Mutamba 2011, 6.) In 2010 a study was made to compare the existing situation of people's sanitation and hygiene practices to the one in 2006, and how ZASP has affected them. According to the results the awareness on dry toilets and use of toilet fertilizer has increased – not only among those who are active in sanitation clubs but in the whole community. Also hygiene education has had positive influences: people wash their hands more often than before and the understanding on the spreading of diseases has increased. (Global Dry Toilet Association of Finland 2010, 14.)

One way to motivate local people was to organize community visits to see for example results of successful development projects. These kinds of visits have been discovered to be efficient capacity building methods. During exchange visits people could see that communities that have similar social-economic situations and face similar challenges as them have been able to achieve permanent improvements in different development work sectors. Experience and knowledge on different issues could be shared if for example other community had defeated some challenges that the other one still suffered from. (Mutamba 2008, 14.)

The clubs got positive experiences from their fields, understood the benefits of dry toilet waste, and got a chance to raise funds by selling the garden products. The clubs played a vital role in ensuring the sustainability of the project as well as committing local people efficiently to the project. People learned responsibility, project management, and other important

skills when participating in the club activities. The sanitation clubs also reduced the prejudices that people had against dry toilets (Mutamba 2008, 10). It was reported that little by little people started to realize that ZASP would not be helping them forever and that they should work more for their quality of life. (Global Dry Toilet Association of Finland 2010, 3, 5, 8, 16.)

The cross-cutting themes of environmental sustainability, gender equality, and disability were achieved satisfyingly. According to Mutamba (2012, 12), they were not specifically included in the project plan but they were however implemented during ZASP. For example dry toilet fertilizers decrease not only people's dependence on expensive commercial fertilizers but also contamination of environment. Gender issues were taken into account properly, which can be seen in for example the participation level of women in the project: even 65 percent of active members of ZASP activities were women.

6.7.2 Challenges

Management of ZASP

In 2007 the local field coordinator was hired to the project. At first this change in the second management level caused some issues about the roles and responsibilities of KTZ and the field coordinator but later they were defined properly (Mutamba 2008, 9). The biggest problem concerned reporting since both of them were meant to report to the project manager and there was a chance that all the information did not reach her (Mutamba 2012a, 10). ZASP was quite dependent of the local field coordinator who was exposed to the local conditions, such as diseases, especially malaria. This affected negatively on reporting and the schedule. Overall there was quite poor communication among and between different management levels. (Global Dry Toilet Association of Finland 2011b, 7.)

One challenge and for example the reason for slow pace of work was lack of commitment of the local partner KTZ that did not monitor the work regularly enough. Proper monitoring would have for example prevented mistakes made in construction early enough. (Global Dry Toilet Association of Finland 2010, 16; Mutamba 2008, 10, 13–14.) There seemed to occur some challenges that were due to cultural differences between the project area and Finnish workers, such as reporting and scheduling problems. In 2012 it was recommended to collect an orientation toolkit for the foreign volunteers in order to keep the cultural clashes to minimum (Mutamba 2012b, 5).

Participation of local people

Lack of commitment and participation of local people was one of the main challenges throughout the project. People were used to getting paid and had a lot of experiences of state-driven development projects where they were offered help, for example boreholes, without a need for them to participate (Mutamba 2010a, 15). In the beginning of the project many people

had wrong expectations from the project – they expected some reward for taking part in the project and refused to continue when they realized they were not going to be paid. According to Mutamba the attitude towards community work was all in all very poor, which is why some tasks that could have been taken for granted, such as collecting sand and stones for the construction of public toilets, were difficult to fulfill. One challenge was also that the project topic was new for the local people and that they just needed time and some proven results to get used to this new idea. (Katambo, 2010, 6; Mutamba 2007, 14–16; Mutamba 2008, 8; Global Dry Toilet Association of Finland 2011b, 19, 24.)

According to Paju (2008, 48), the lack of commitment resulted from people's high level of poverty rather than their lack of interest. It is stated in a report made in 2011 that communities are "desperately looking for livelihood sources that provide them with immediate benefits. This compromises their commitment to the project which generally provides long-term benefits." The stigma that surrounds the dry toilet and especially the handling of human excreta also affected people's will to participate. Other reasons for the poor community participation included poor leadership skills, lack of trust towards other people and the local partner KTZ, and intra-group conflicts. Even though people would have knowledge on conflict management they may find solving problems challenging. For this reason the sanitation clubs were guided to make by-laws. According to Lepaus, only few clubs were functioning in 2010 and many members were participating just "to get a free t-shirt". Her recommendation was to focus on household toilets since the public ones did not seem to function as wished. (Global Dry Toilet Association of Finland 2011b; Huuhtanen, e-mail 23.9.2013; Katambo 2010b, 11–12; Lepaus 2010, 6, 9.)

Building and maintaining of dry toilets

The construction of toilets started slowly due to a lack of commitment of the local people. One problem was the unreliability of material transportation, especially during rainy season when many roads could not be driven. This caused delays in construction of some toilets. Fuel shortages were experienced in Zambia for instance in 2010, which caused even more delays in the material deliveries. In addition, until 2012 ZASP was dependent on transportation organized by KTZ. In some communities, such as Mpongwe Junction which is an important market area, where the ground is very hard or the ground water level is very high, the digging of latrines is difficult and during rainy season the toilets flood which causes inconveniences and spreading of diseases. So even if ZASP provided one or two dry toilets, the sanitation problem would still be huge. (Global Dry Toilet Association of Finland 2010, 16; Mutamba 2008, 10, 13–14.)

Faced challenges in using and maintaining the dry toilets included misuse of toilets (e.g. using of both chambers although they should be used one at the time). Especially in market areas the toilets are used by a lot of people who do not know how to use a urine diverting toilet. This causes mess and more work for the people responsible for maintenance. It was also noticed that urine pipes of dry toilets get blocked or even break easily. This may

be caused by the wrong use of bulking material. Unblocking and cleaning the urine pipes was seen one of the main difficulties in maintaining the toilets. Even during the third project phase the clubs seemed to need more education about maintenance and such issues as unblocking urine pipes. (Mäkipää 2011, 2–3; Leppänen et al. 2012, 30.)

Even though there was always supposed to be someone responsible for maintaining of dry toilets, there were many difficulties especially with public toilets. Since maintenance was based on volunteering and people lacked activity or wanted to be paid for their work, the tasks could easily be neglected resulting in messy toilets that were inconvenient to use. (Kettunen 2013, 13.) Creating commitment was challenging and in 2011 a study showed that some public toilets were not used at all, some lacked doors, some did not have any bulking material to use, and so on (Mäkipää 2011). The responsible ones mostly came up with excuses when they were asked why the situation was like that. The problem seemed to be that people felt responsible to the ZASP management for the maintenance and did not feel that the toilets were their own. Even in 2012 some people thought that for example a leaking roof is a problem of ZASP, not the community (Katambo 2012, 10). This situation could have been improved only by empowering the locals and by getting them to realize their responsibility.

It was obvious that most families faced challenges in building their low-cost toilets: for some reason they were not committed enough to finish their toilets. Reasons for this were for instance lack of money to hire builders, buy materials, and transport cement from town. One way to solve the problem of unfinished household toilets was to give the builders a timeframe when the upper part of toilet should be finished. (Leppänen 2012; Katambo 2012, 5–6.)

One challenge that was discovered in studies made during project was that the location of toilet is very important to consider carefully since many people think that it is embarrassing to be seen to go to toilet. This was obvious especially in Luansobe Basic School where too open location of the toilets resulted in a situation where almost no-one used them. The situation of Luansobe was all in all one of the big failures of ZASP: the headmaster and most teachers lacked interest and motivation to participate in ZASP and the maintenance of toilets did not have continuity. Some people were afraid that the toilets would smell like pit latrines do, which does not happen if proper ventilation and bulking material are used. Nevertheless, the fear of smell caused some people to construct household toilets far away from their house. This can result in abandoning the new toilet because it is too far away to be conveniently used.

Use of toilet fertilizers

The prejudices and stigmatization towards toilet fertilizers was one of the biggest challenges the project faced. The thought that toilet waste would be brought close to food was repulsive to many people. The stigmatization considered however more the use of faeces than urine. (Katambo 2010a, 6; Paju 2008, 48.) This challenge was solved by education and awareness

raising that was given to local people throughout the project. People who were not participating in the project did not gain this information so easily, which had influence on ZASP members' capability to sell their toilet fertilizer products. The situation improved during the project but ZASP could have focused more on this challenge. Education could have been given for instance in the market areas to normal people who buy the products. (Leppänen 2012.)

The use of urine could be challenging if for example the right dilution rate was not known. There occurred also a lack of urine containers. The test fields had also a few difficulties. Some crops were eaten by chickens, compost and urine got stolen from some clubs, and the weather was not always in favor of good yields (Katambo 2011; Katambo 2012, 7; Mutamba 2011, 13). But the mistakes were learned from and for instance the fields were fenced to prevent animals from getting there. One challenge that some clubs faced was the long distance between water source and field, which made it difficult to water the plants. The promotion of synthetic fertilizers done by the government was seen as a threat to the use of dry toilet fertilizers and many people preferred them despite their high prices. (Katambo 2009, 6; Mäkipää 2011, 2–3, 8; Mutamba 2007, 13; Mutamba 2008, 11.)

Other challenges included the long distances in the project area and lack of transportation until 2012. Ineffective ways of fundraising slowed down the achieving of benefits that sanitation clubs got from the use of toilet fertilizers. There were also personality clashes, poor communication, and land ownership disputes among and between the clubs. The clubs faced financial difficulties when some people failed to pay their membership fees, crops were lost, or big costs were needed to for example repair a broken borehole. (Global Dry Toilet Association of Finland 2011b, 24; Katambo 2010d, 5; Leppänen et al. 2012, 30; Mutamba 2010b, 5; Mutamba 2012a, 12–13, 17.) Also some important issues were disregarded: the cooperation aiming at designing toilets for disabled people failed and for instance climate change and the negative effects of charcoal production were not emphasized enough.

7 COMPARATIVE PROJECTS

In order to make a case study more reliable, the answers to the research questions are sought also from other ecosan projects. The introduced projects are quite similar to ZASP, focusing on community-led approach and promoting dry sanitation.

7.1 Projects by GDTF

GDTF has two other ongoing projects in sub-Saharan Africa so useful experiences from these projects are presented first. Unlike ZASP, these two projects are located in large suburbs: one in Lusaka, the capital city of Zambia and the other one in Mbabane, the capital of Swaziland. They pro-

vide valuable information of urban dry sanitation projects, which can be utilized in this study as well.

7.1.1 Lusaka dry sanitation development project

The project in Madimba, a suburb in Lusaka, focused more on household than on public toilets. Cost-sharing had a big role in the project and it was executed based on made criteria, such as the vulnerability of households. The system where households have to pay a part of the constructed toilet develops ownership and also saves money from the project budget. A major motivator for the people in Madimba to build a dry toilet was the achieved status that the owning of an improved sanitation facility caused.

One important feature in the project was the established community based enterprises (CBEs). These CBEs work with different activities that the project has provided, such as construction of dry toilets, emptying the toilets, and using the toilet fertilizers. They provide continuation for the project as well as income for the beneficiaries. All the households may not be willing to use the produced toilet fertilizers or do not have the space to establish gardens. In these cases it is more efficient to collect the toilet waste and use it in a bigger, collective field. One challenge that is typical in this kind of suburbs of big cities is the big amount of temporary inhabitants and tenants, which may affect negatively people's interest and capability to use the dry toilets. In these cases the house owners or old inhabitants should always teach the new residents to use the toilet. (Kettunen 2013, 10–14.)

The project in Madimba did co-operation with the University of Lusaka in order to create a course about ecological sanitation. The local government and decision-makers were influenced together with other organizations that work for water and sanitation issues in Zambia. With the help of this co-operation, the awareness about ecological sanitation reached political actors and ordinary Zambian people. In addition to the mentioned activities there is also a theatre group that has an important role in awareness rising on hygiene, water and sanitation topics in Madimba. The overall sustainability of the project in Madimba is ensured by the CBEs and the work of local partner organization. (Kettunen 2013, 8, 12, 16.)

7.1.2 Msunduza dry sanitation project

In Msunduza, which is the largest slum of Mbabane in Swaziland, one of the objectives has been to train sanitation experts from each part of the project area. These educated people would then share their knowledge with their communities, and this way information about ecological sanitation would reach a lot of people. There are also so called EnviroClubs that consist of the owners of dry toilets, their neighbors, leaders of communities, and other interested people. These clubs spread information about ecosan solutions and work together with the sanitation experts. (Kettunen 2013, 9, 12.) It has been discovered that the community leaders see the financial benefits of the dry toilets, which affects positively on their attitude

towards the project. Without their support and participation the project would not be likely to succeed. The studies made in Msunduza discovered that the best ways to make people participate are education, practical training, and showing them the project results. (Heikkilä & Kirstinä 2012, 39–31.)

7.2 Other projects

The following projects are collected from different sources with an aim to find ecosan development projects that are similar enough to ZASP that they can be compared to it and utilized in the study. The focus is on projects that bring some new information, methods, or techniques to execute ecosan projects.

7.2.1 Successful ecosan projects

In a pilot project in Omaruru, Namibia, the objective was to convince the local village leaders and decision-makers that dry sanitation could be a good and beneficial solution for the area. Dry toilets were provided for local households that took part in the expenses. This cost-sharing ensured ownership and the households took full responsibility for the toilets after the project. The project acceptance was high since people did not have any sanitation facilities before the project. Also the saving of water was a motivator because people could not afford to pay for water. The project was a success and when the area was visited after 1.5 years all the toilets were in use and well maintained. During the project, co-operation was done closely with the local authorities so that they could carry on executing similar dry sanitation projects in the future. (Ingle et al. 2012, 63, 66, 70–72; Kleemann & Berdau 2011, 17.6.)

A project executed in several provinces of Kenya in 2006–2009 worked together with community-based organizations. The objectives were to build UDDTs and empower communities. The base of the project was awareness rising and a "demand-responsive approach with strong participatory elements that create ownership within the community". The future toilet owners had to pay at least 20 percent of the UDDT costs and this could be done by providing materials and labor. The project succeeded to increase people's interest towards UDDTs and the fertilizers gained from them. It was discovered that the project requires regular monitoring for about 1.5 years after the toilets have been taken into use in order to ensure sustainability. (Rieck 2010, 10.1–10.5, 10.9.)

A project in Guara-Guara, Mozambique, introduced UDDTs the first time in a larger scale in the country. The project was able to convince the local people and decision-makers about the benefits of UDDTs. In 2006 it was reported that UDDTs are promoted even in the national guidelines to protect ground water. The used, successful methods were for example cost-sharing and involving local people in decision-making. Awareness rising was however insufficient, which influenced negatively the sustainability of the project results. (Fodge, Macário & Porsani 2011, 16.5, 16.7.)

The acceptance of new ecosan solutions promoted by development projects can be improved by choosing a technique that is not too different from the sanitation facilities that local people are used to using. This was noticed in a project in Arba Minch, Ethiopia, where a toilet model called Fossa alterna was promoted. Fossa alterna does not separate urine from faeces but they both go to two pits that are dug under the toilet structure. After the first pit is full, it is covered with soil and left to decompose and the toilet structure is moved to the second pit. When the second pit is full, the first one is emptied to be used as fertilizer and taken into use again, and the second one is covered. The using of these two pits can be continued for many years. The project in Ethiopia was successful and accepted by most of the people, mainly because the introduced toilet model reminded the traditional pit latrines. (Shewa & Geleta 2010, 7.1–7.2, 7.4.)

7.2.2 Ecosan projects in schools

In Leogane, Haiti there was a dry sanitation project focusing on providing local schools and orphanages with proper sanitation facilities. The systems differed a bit from the ones used in ZASP: the toilets were not diverting urine and they used on-site method to treat the excrement. This means that the toilets were emptied to composts that were located next to the latrines. There were pictures with instructions to use the toilet inside the toilets, and the outside walls had pictures of nutrient cycle. (Jenkins 2012, 77–78, 87.) In some projects it has been noticed to be more efficient to hire a maintainer than leave the maintenance task to the community. In these cases however the locals have to of course pay for the maintainer. (Kettunen 2013, 13.)

A project in Western Kenya focused on providing dry sanitation to local schools in 2006–2010. A study conducted in 2011 mapped out the factors that affected the positive results and sustainability of these school projects. One significant thing was that the maintenance was the easiest in small schools and in schools with many toilets. Also, the schools that had taken part in the funding of the toilets were most successful. The schools had organized the maintenance by hiring someone to take care of the toilets or by handing the responsibility for teachers and pupils. There could for instance be health clubs that did the maintenance. In any case, the adequate training of the responsible ones is vital. In addition, the promoting of dry toilets to school administration is of course important. (Pynnönen, Tuhkanen, Rieck & von Münch 2012, 137, 141, 143, 146, 152–153.)

7.2.3 Educational project experiences

Starting in 2002, a sanitation development project in the villages of Hanahai and Paje, Botswana, introduced UDDTs to local families. The families had to contribute to the toilet expenses and they were encouraged to establish gardens. The project results and sustainability were evaluated during a follow-up visit in 2009 and it was discovered that about half of the built toilets were not used or maintained anymore. It was noticed that if people already had pit latrines it was hard for them to see the benefits of

using and maintaining the UDDTs that were surrounded by a strong taboo. In addition, if the decision to build a UDDT was not made by the one responsible for the maintenance of the toilet, it was not maintained properly. Many people were also reported to have so called dependency syndrome on external aid from their past development project experiences. The conclusion was that by understanding the benefits of improved sanitation, having a demand for new sanitation facilities, and monitoring the project properly, the use of the new UDDTs was ensured. (Werner, Klingel, Bracken & Schlick 2005, 2.1–2.3, 2.6–2.7.)

In Koulikoro, Mali there was a small-scale ecosan project that introduced a low-cost UDDT model in the area. The project unfortunately failed due to many problems, the most difficult one being the community's lack of interest towards ecosan solutions. One thing noticed based on the project experiences was that it is very important to plan the project scale properly. In Koulikoro the scale of the project was too small which lead to too little urine that could be used. This caused also inability to establish a small enterprise to collect the urine, as planned. (Werner, Klingel, Bracken, Schlick, Freese & Rong 2009. 15.1, 15.5.)

8 CONCLUSIONS

In the following, the conclusions of the study are discussed in a general level. The focus is on the managing of the whole ecosan project and the using of participatory methods. All in all ZASP followed the principles of development project management quite well, with a strong focus on participatory methods and capacity building. The conclusions below are presented by collecting the most important ways to ensure the sustainability of an ecosan development project and discussing how each of these ways was discovered based on the study.

Defining the responsibilities properly and having good communication among and between all levels of project management

When the responsibilities of different project management levels are defined properly, the project proceeds fluently and everyone knows what their task is and who they report to. There were some difficulties with communication and sharing of responsibilities among the ZASP project management. These issues must have had some influence on the succeeding of implementation: if for example information about some challenges faced in construction of toilets did not reach project management, it slowed down the solving of these problems. For instance the local field coordinator was hired to fill a communication gap between the communities and the project management, and the central committee was founded to still enhance the communication.

Ensuring that there is demand for new toilet facilities

The demand creation is one of the most important things in all development projects. If there is no need for new sanitation facilities, the project is most likely to fail. It was discovered in the project in Botswana that if the people in the project area already had pit latrines, they were not as motivated to participate in the project as the people who did not have any toilet

facility. The demand creation in ZASP was quite slow and even though local people seemed to understand the benefits of improved sanitation, the dry toilets were difficult for most of them to approve. This issue can be strongly affected by taboo and negative prejudices that can surround the sanitation topic.

Having a community-led approach that focuses on building communities' capacity and empowering them

The methods of community-led total sanitation (CLTS) are useful to empower local people to take responsibility over their sanitation issues. There was no mention of CLTS in the documents of ZASP but the approach is quite similar in both of them. The focus of ZASP was all the time to raise awareness, empower the communities, and provide them with ways to execute sanitation in a sustainable and hygienic way. The biggest difference between ZASP and CLTS approach was that in CLTS the projects funds are not used to construct toilets, only to empower and educate communities. Education on capacity building, which was given especially in the last phase of ZASP, ensured that people gained the tools to keep on working with the toilets and the clubs and to raise funds efficiently.

Involving local people in all activities and decision-making

The development project has to be planned and implemented together with the beneficiaries by involving them in different ways. Besides education, workshops can be used for planning and evaluation of the project. These gatherings empower locals to work towards a common goal and to take responsibility. From the participatory methods that were used in ZASP, the sanitation clubs had the biggest role. They not only spread information and enabled those who were interested to join the project but also required people's commitment and thus enhanced their responsibility for the project activities.

Educating people by using participatory methods

Participatory workshops and other educational gatherings are important since they allow people to see and do things in practice and leave room for their questions and opinions. Hearing good experiences from other people can also be very important in awareness raising process.

Showing people the benefits of the project, emphasizing short-term and economic benefits

It was noticed during ZASP that when people actually see the results of the project, such as crops grown with toilet fertilizers, they are more motivated to participate. But if people feel that the benefit from their often voluntary work for the project is not big enough, they most likely stop this work. People living in poverty face so many challenges that short-term benefits from for example burning charcoal are seen more valuable than sitting in a sanitation club meeting. Hence, the sanitation projects should be able to provide communities also with more immediate benefits. In addition, if the use or maintenance of the dry toilets is too difficult or takes too much time, people hardly see the benefits compared to easier ways to relieve themselves.

Focusing on cultural sensitivity and designing a toilet model that is suitable for the project area

One important aspect in all projects is cultural sensitivity. One quite surprising example from ZASP is that the location of toilet should not be too open since people feel embarrassed to go there if someone sees. This should have been found out before construction of the toilets. All in all, the promoted sanitation system should be not only culturally suitable but also socially acceptable, convenient to use, and of course inexpensive enough to construct.

Constructing sanitation facilities by using cost-sharing methods

The introduction of a low-cost model in ZASP was a good solution that enlarged the project and increased the number of beneficiaries. Cost-sharing method was utilized though it could have been more efficient: the management promised to provide the iron sheets and ventilation pipes only at the end of the project. The building of household model toilets should not be too difficult or expensive for the local people to construct. Cost-sharing is very common method in the construction of ecological sanitation in projects worldwide and it has been noticed to be a good tool in creating ownership.

Establishing a local actor, such as sanitation clubs or community based enterprises, that continues the project activities

Sustainability of ZASP was ensured by creating a local actor that takes the biggest responsibility of the project activities after the project itself withdraws from the area: the central committee and below it the sanitation clubs. Without the clubs and the central committee there would not be future for the dry toilets in the project area. For instance in Madimba, Lusaka, this was solved in a different way: by establishing community-based enterprises that would keep on working together with the community to maintain the built toilets.

Monitoring the project regularly and making chances if necessary

Monitoring of ZASP was regular, efficient, and participatory during the whole project. It is important that monitoring has effects and that project activities are changed based on its findings. Proper and measurable indicators are vital in order to monitor the project effectively and with the same criteria throughout the whole project. Also, the participatory approach should be remembered and the beneficiaries encouraged to assess the results in their point of view.

Making and testing an exit strategy

Exit strategy is a vital part of the project and ensures that the created activities continue after the project itself withdraws from the area. In ZASP, the exit strategy seemed to be left out from the planning phase and it was made only later during the project.

Focusing resources on empowering and sensitizing also the higher authorities about project issues

Besides the local communities, a higher level needs empowerment as well, which has been discovered in many projects. By discussing with local au-

thorities, traditional leaders, and national policy-makers, wider results and sustainability can be achieved.

All the listed conclusions should be noticed and executed in all ecosan development projects. Focusing enough time and resources on the planning of the project is essential as well as remembering the most important thing in all development work: to plan and carry out the project in a way that the project and development workers become useless. Only this way the development projects can be sustainable and beneficial. The guide, *Planning and implementing a sustainable and participatory ecosan project*, is made based on the findings of this study and can be found in appendix 1. In the guide the whole process of the ecosan development project is introduced step by step, applying the knowledge gained from ZASP, other projects, and the theory base. The guide and especially its layout are only suggestions for GDTF which can use the contents of the whole thesis in a way they could be utilized the best.

9 EVALUATION OF WORK AND LEARNING

The aim of a case study is not usually to generalize the results but to study and describe an existing situation. In this thesis, case study was however only a tool to make a guide so generalization had to be done. This was executed by comparing the experiences from the studied case, ZASP, to the existing theory and general knowledge about ecosan development project management. Also experiences from other comparable projects were used. The combining of all this information was challenging but ensured that the made conclusions are reliable. The guide was made utilizing the findings and conclusions of the study.

All in all, the objectives of the study to find the best practices to carry out an ecosan project and to make a guide for GDTF were fulfilled quite successfully. The research questions were answered with a focus on ensuring the sustainability of ecosan projects, as was wished by GDTF. It was quite challenging to combine all the information of the study and to represent it in a way that summarizes and generalizes the results properly. The solution was to present the best practices in general in the conclusions of the thesis and then more precisely in the actual guide.

The used sources in the theory phase were from trustworthy publications such as articles and studies. The articles were written mostly by professionals of the topic: for instance the article introducing community-led total sanitation was written by the developer of the method himself. Some of the used studies were bachelor's theses so they may lack professionalism but can however provide new and useful results. Official sources such as websites of Ministry for Foreign Affairs of Finland, the United Nations and the European Union were used. Most of the used sources were quite recent but for example *Guidelines for Programme Design by Ministry for Foreign Affairs of Finland* was from year 1999. It was used because a more recent guideline on this topic could not be found. In addition, the materials made by Global Dry Toilet Association of Finland were naturally used. The ones used in the theory phase of the thesis were guides and

other general documents, but in the making of the case study the sources included reports and other documents made for Ministry for Foreign Affairs of Finland with an aim to receive funding for the project. This could have affected the content of for example evaluation reports to show the results of the project in a good light. This was of course taken into account when making the study by evaluating the documents critically and mirroring them against the author's own experiences from the project area.

Making this thesis was an educational process. It was rewarding to make a study of this size and to develop skills to search for information, to collect and analyze data, and to understand and manage entities. Even though I had some base knowledge about development projects and I was familiar with ecological sanitation, my general knowledge and understanding especially about the process of managing development projects and execution of ecosan development projects increased a lot. The biggest challenges were defining the scope of the study and keeping in schedule. I did not keep in my original plan to finish the thesis during spring 2013 but it was actually a good thing to postpone it to September 2013 in order to think and analyze everything thoroughly. Writing the thesis in a language that is not my mother tongue was at first quite challenging but got easier during the writing process, increasing significantly my ability to write these kind of reports in English in the future as well. However, since the thesis is written in a foreign language, the writing is probably not as diverse as it could be and it was at times difficult to express some thoughts precisely enough. All in all, the topic of the thesis was very interesting and combined development work questions with ecological, social and economic sustainability in a way that is very topical in a global context.

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Appendix 1/1

Planning and implementing a sustainable and participatory ecosan project

A guide for NGOs working in developing countries

INTRODUCTION

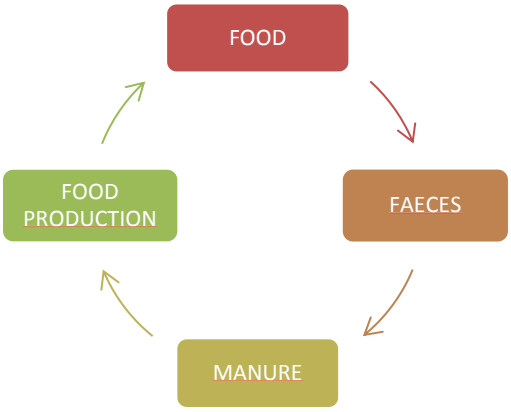
According to WHO, sanitation consists of methods to collect human excrete and urine in a hygienic way. Approximately 2.5 billion people in the world do not have a proper sanitation system at home, which basically means that they use unsafe and unhealthy facilities or defecate in the open. Most of these people live in rural areas in developing countries. The lack of proper sanitation causes for example diarrhea and malnutrition and the ones that suffer from these water-related diseases are mainly children and women. In the seventh UN Millennium Development Goal that concerns environmental sustainability there is a target to halve the number of people without access to safe drinking water and to proper sanitation by the year 2015. While the goal on drinking water has been achieved, the sanitation goal seems to be out of reach. In order to succeed, it would be vital for development practitioners, policy-makers as well as governments of developing countries to consider cheap, sustainable and locally suitable community-based solutions. [1, 2, 3]

One form of executing development work is projects by non-governmental organizations (NGOs). The NGO projects complete the public development cooperation with their good, direct contacts to beneficiary countries. Usually the work of NGOs can reach people and communities that bigger projects may not get to. Besides working for the Millennium Development Goals, NGOs aim at strengthening developing countries' civil society and support the local NGOs. The work of NGOs is often focused on the basic needs of people and communities: education, health and improved livelihood. [4, 5]

This guide introduces the best ways to carry out a development project that promotes ecological sanitation. The right ways to execute ecologically and economically sustainable sanitation should be weighed each time to the specific location. Some features however apply to almost all ecosan projects and they are presented in this guide. The focus in this guide is on dry sanitation projects executed by NGOs. [1]

1. ECOLOGICAL SANITATION & NUTRIENT CYCLE

Ecological sanitation (ecosan) is a holistic approach towards sanitation and it is based on the idea of nutrient cycle. In ecosan, human urine and faeces and also grey water from households are seen as a resource and not as waste. The aim is to reach ecologically and economically sustainable sanitation situation by closing the local nutrient cycles and returning the nutrients back to the soil, as can be seen in the figure below. Ecosan also aims at minimizing hygienic risks and protecting the environment by preventing excreta from contaminating water sources, food and environment. [1, 6]



There is not a certain type of ecosan solution that could be used in all areas and cultures. The sanitation system should be always chosen according to the certain situation, in terms of local culture and preferences.

The chosen sanitation solution should be:

- hygienically safe
- socially acceptable
- economically feasible
- environmentally sound
- technically appropriate
- convenient to use [7]

A proper sanitation system is always well maintained and prevents the user of the latrine from being in contact with the excreta as well as the community from exposing to the faeces for example through contaminated water. Since ecosan is based on the idea of reusing human waste, it is very important to ensure hygiene and proper handling of the excreta. The ecosan solutions vary from toilets with one chamber that is emptied to compost, to urine-diverting dry toilets that have two chambers for manure and a container for urine. More about the choosing of the right ecosan solution can be read in *A guide to sanitation and hygiene in developing countries* by GFTD. [1, 8]

Sanitation projects often include improving of water issues into the project, or vice versa. Even if the main focus is on sanitation, the connection to clean water and hygiene should be emphasized during the project.

2. PLANNING OF AN ECOSAN PROJECT

The planning and implementation of an ecosan development project can be challenging and must include tools to ensure sustainability and effectiveness of the project. It should be remembered that the most important task that development workers have is to make themselves useless. Studies have proved that the two main reasons for not achieving sustainability in ecosan projects are technical problems and lack of ownership. Succeeding requires good planning and implementation that involve the local people in decision-making in order to create and improve their ownership of the project. [1, 7, 9]

2.1 Need for sanitation

At the beginning of the project the most important **stakeholders and beneficiaries** and their needs are identified and a project idea is set together with them. The **will to develop local sanitation situation** may differ between the authorities and the local people. It is vital that both of these levels are motivated and have the need to participate in the project. The demand creation will continue throughout the whole project. The demand for improved ecological sanitation services can be achieved by *awareness raising* and *providing the local people with suitable sanitation solutions*. In addition to the rational facts, also the *emotional benefits* are worth sympathizing: for example the rise of family's living standard and social status can be important in motivating local people to participate. Other factors that can create demand are for instance convenience, need for privacy, and improved safety of especially women and children. Convenience also applies to the usefulness of the new toilet facility: people will not invest their time and money to a new sanitation system and its maintenance if it is too unpleasant or difficult to use or if old habits such as open defecation seem easier and cheaper solutions. [3, 10, 11, 12]

2.2 Baseline study and defining of objectives

During the planning process, a baseline study is made. Its aim is to identify the existing sanitation situation and the requirements, needs and also resources for new sanitation systems. Different options that could improve the situation are evaluated. General and sector-specific studies are made, and previous studies in the same area are examined. Also the other ongoing and previous development projects in the area are mapped out as well as the national development goals. This background information is collected from for example users of new toilets, farmers, and authorities.

The baseline study contains the identifying and analyzing of following aspects:

- **Political environment and legal framework**: A supportive policy environment is vital in all projects
- **Economic situation**: Financial viability and sustainability of the project must be evaluated as well as its overall influences to the country's economy
- **State of environment**
- **Social and cultural situations**: Social and cultural aspects contain for example different subcultures and relations between them, values, understanding of ownership and justice, practices, beliefs, religions, and gender roles
- **People's capacity**
- **Technical and financial capacity** [13]

Socio-cultural analysis is an essential tool to identify the things that are connected with or influenced by the project. Proper analysis ensures **cultural sensitivity** of the development project and is a good way to integrate into the local culture. Sanitation development projects attempt to influence on the values, attitudes, traditions, and habits that are very deep in many cultures. This is why it is essential that the project has cultural sensitivity from the beginning to the end. The cultural factors worth noticing are psychological constrains that prevent handling of human manure, social factors such as gender roles, and the influence of religions. If the project lacks cultural sensitivity, it has a big risk to fail. Also, if local culture is not valued and taken into account during the development project, it can cause not only failing of a project but also weakening of the local culture. [13, 14, 15, 16]

Gender aspects and equality are important in development projects. Gender is a social and cultural concept which determines the roles of men and women and varies in different cultures, locations and generations. Gender roles are constantly changing. In sanitation projects the gender questions are very important because women and men benefit in different ways from improved sanitation situation and have different needs when it comes to sanitation solutions. These issues are taken into account the best if both men and women are involved in the process. [1, 14]

Based on the baseline study **the scope and objectives of the project** are set. There are a few long-term objectives, such as improving the life quality of people, and more specific objectives, such as the number of toilets that will be built in the project area. Well-defined objectives are achievable, aim at improving the existing situation, help the project to succeed, and ensure the sustainability of the project. In order to create goals that all stakeholders feel motivated to work for, a sanitation planning team can be established to collect sanitation experts, facilitators and representatives from stakeholder groups together. **Project strategy** is formed based on the objectives. In project strategy the overall objectives, activities, needed resources and external factors are stated. Making of the strategy usually requires compromises and prioritizing. The **planned results** and **beneficiaries** of the project should as well be listed in order to monitor the project properly. **Possible risks** and ways to avoid them should also be identified. [12, 13]

The most suitable sanitation system for the certain project is identified after piloting and evaluating different solutions and finally choosing the best option. Estimation of costs and availability of different materials and tools affect the decision. In this phase it is essential to hear the opinions of local people in order to find a solution that fits in the local culture and that would be used by locals. The whole chain of dry sanitation should be planned and there should always be a way to utilize the toilet fertilizers. [12, 17]

2.3 Management and responsibilities

In development projects there are always different management levels. One example of these levels can be seen below. In some cases there for example is no project manager but only the funding NGO and then the local partner and other local workers who execute the project. The reporting responsibility goes from the bottom to the top: communities report to local workers and to the local partner about their progress, who report to the project manager, who then reports to the administrative level.

Administrative level:	- Board of the executing NGO - Project manager
Local management level:	- Management of the local partner - Other local workers
Community level:	- Communities, local people

The **administrative level** is responsible for administrating the project and making the biggest decisions. It follows and assesses the project and its progress. The **project manager** has the most responsible role in execution of the project. The implementation, monitoring and evaluation of the project as well as the making of all big decisions concerning the project are under the responsibility of project coordinator. The project should always have a **local partner**, usually another NGO, that executes the project in the local level and acts as a source of information. The other people working in the local management level can include for instance **local field coordinator** who, with the local partner, manages the project activities and monitors the project.

The people of project area form the **community level of management**. Local people's participation in the project has to grow throughout the project with a goal to involve them in decision-making and make them committed to the project. Eventually the aim is that locals take full responsibility of the project activities and that the project management acts only in the background. Different actors and permanent structures to maintain the responsibility of community level are for example *sanitation clubs* and *community-based enterprises* that are introduced later in this guide. [18, 19, 20, 21, 22, 23]

2.4 Co-operation with local authorities

The projects should always work in co-operation with local traditional leaders and government authorities. The traditional leaders can include for example the eldest of the villages and the chiefs of the area. The opinion of these kinds of leaders is important for a project that promotes new innovations and tries to change people's attitudes. The local authorities can include for example local environmental health officials and district offices. The aim of development projects is to improve the situation not only locally but also on a higher level. Developing the sanitation sector in developing countries' local and national governments is important. [9, 24]

In the field of ecological sanitation, the issue that **legislation** often concerns is the agricultural use of excreta. In developing countries the legislation on this topic can be nonexistent or it can even forbid the use of human excreta on food crops. These kinds of things have to be found out before starting an ecosan project. Development of the national legislation in cooperation with different stakeholders is important and supports the local government and people as well as the NGOs working with these issues in the area. Especially when talking about large-scale using of excreta, the quality and hygiene control and some kind of certifications should be considered. WHO (World Health Organization) has set guidelines for safe use of wastewater, excreta and grey water in agriculture and aquaculture, and these guidelines can be used if the local legal framework is missing. [25]

2.5 Participatory planning

Problem in many sanitation development projects has been that the constructed toilets have been left without any maintenance or use after the project. To prevent this, the responsibilities have to be defined clearly during the project and the long-term benefits of dry toilets have to be acknowledged by the beneficiaries. Participatory methods allow the local people to be a part of the project from the beginning to the end and ensure that locals can build a sense of ownership of the project. Participation increases effectiveness and enables people to determine their own lives and also learn from each other. One role of participatory methods is to aim at reducing the power distance between stakeholders. [10, 20, 21]

The aim is that people whose life the project influences have the possibility to take part in decision-making in different phases of the project. After all, local people know the best their own potential and limitations. The participation of local people should start already in the beginning of project planning. This succeeds when the development needs are found out together with the locals, taking the needs of for example minorities and genders into account. In the following, a few well-known and effective participatory approaches are introduced. [1, 9, 13, 26]

Participatory Rural Appraisal (PRA)

- involves locals to collect, analyze, and use information in the project
- empowers local people to make decisions on their own issues
- strengthens communities
- respects local people and their culture
- emphasizes learning and sharing of information
- is not a certain method but a range of different methods that should be used variedly
- supports communities' participation in planning, analyzing and discussion [26]

Community-led total sanitation (CLTS)

- leans on PRA methods
- enables communities to become aware of their sanitation situation and problems
- aims at providing people with tools to be motivated to change their sanitation habits
- brings people together to make collective decisions on their sanitation, health and environment
- encourages communities to take responsibility of common issues and to improve the community
- aims at stopping open defecation and ensuring that everyone has a hygienic toilet and a possibility to wash hands [27]

Participatory hygiene and sanitation transformation (PHAST)

- aims at strengthening and empowering communities to develop their own livelihoods
- encourages people to participate in hygiene and sanitation projects
- raises awareness about the relationship between hygiene, water and sanitation
- uses different participatory tools to involve local people in the planning, decision-making, implementation, and evaluation of the project [6, 28, 29]

3. IMPLEMENTATION OF THE PROJECT

The sanitation planning team combines one plan for the implementation of the sanitation project based on the objectives and strategy. This starts with determining for example people's tasks and responsibilities, realistic schedule and budget, and technical details and needed resources. During the implementation, the project plan and its activities are updated regularly and specified considering for instance the timing and responsibilities. Implementation should always be well-controlled and scheduled. The implementation can include building of the new sanitation facilities and infrastructure as well as sharing of information through for example workshops, drama performances, posters and media. Things such as the use of cost-sharing methods in construction of sanitation facilities can be weighed. [12]

3.1 Education

Education can be conducted in different ways but for instance workshops have been noticed to be a good way to gather people together and to allow discussion, questions, and opinions. One good way is to utilize existing information channels when giving education: if there is a gathering in the community, sanitation education can be included in the programme. In every case it is important that people can participate and do things in practice to learn better. Workshops and other discussions can also be used as a tool for planning and evaluating the project together with the beneficiaries. [30]

The topics of education are good to introduce step by step. The first thing that education should focus on is **awareness rising** and **health and hygiene education.** Awareness rising has a key role in ecosan projects, especially if the aim is to introduce entirely new innovations in the area. Relationship between hygiene, water and sanitation should be emphasized. Education decreases the level of stigma that surrounds sanitation projects and improves the use of gained knowledge into practice. Trusting environment is essential when talking such an intimate issue as sanitation. In order to reach proper results, gender roles should be noticed and education can be given to men and women together but also separately. When people are well involved and participate in decision-making, the awareness rising brings better results. The creation of demand for improved ecosan systems is also continued.

The first built dry toilets and the demonstration fields have an important role in raising locals' interest and awareness on dry sanitation. People's attitude towards new sanitation systems change to positive usually when they hear good experiences from others and see the benefits. It has been discovered that besides education sessions organized by the project, other members of communities are the most important source to hear about dry toilets. One way to execute awareness rising are different drama performances made by communities or for example school pupils. Different guides, posters and for example drawings on the walls of the toilets are also a good tool to enhance the sensitization about the topic. [17, 22, 31, 32, 33, 34, 35]

When awareness rising has gained some results and first pilot toilets have been built, the education about **use and maintenance of toilets** can start. Information about construction, use, and maintenance of the toilets is shared. People usually want to learn about practical things such as costs and benefits of new sanitation systems. Gaining knowledge about these kinds of things and getting to know the new sanitation facilities usually increase also the awareness and approval level among the community. [20, 23]

When toilets have been in use for a while and things mentioned above are educated (though the education of all issues must be continuous), information about **use of toilet fertilizers** can be shared. Safety in storing and handling of dry toilet waste has to be emphasized throughout the project as well as the difference between excrement and compost. [30]

The last but very important topic of education is **capacity building**. It includes leadership and motivating skills, community mobilization, conflict management, and fundraising. Gaining of these skills is required in order to succeed in ensuring the sustainability of the project. The education sessions should be practical and focus on for instance communities' skills in action planning. One way to motivate local people and build communities' capacity is to organize **community visits**. They allow people to see successful projects and their influences on the lives of people who have similar socio-economic situation and who face similar challenges as them. [18, 36]

3.2 Construction and maintenance of toilets

As mentioned, the right sanitation system is chosen in the terms of local conditions and other different factors. No matter what the chosen toilet model is, the constructed toilets have to be safe and hygienic, easy to use and maintain, and built using as much local materials as possible. The connection to hygiene has to be promoted by ensuring that every toilet has a hand-washing device. The technical implementation is led by local sanitation experts and engineers and can vary in different projects. In some projects no money is focused on the building of the toilets but the local people build and fund them out of their own interest. In most cases, however, the project funds are given to the construction. Whichever the case, the people to whom the new sanitation facilities are for should always take part in the building of the toilets. This way the people feel that the toilets are their own and the sustainability of the project is ensured. The training of local builders is good to be done in a practical, work-based way. One small but very important thing in implementation of sanitation projects in developing countries is the seasonality: rainy seasons usually make the building of toilets and supplying of materials difficult. [17, 18, 21, 24, 37, 38, 39]

The project can focus either on public or household toilets, or on both. The local trained builders take part in building **the public toilets** that should be evenly located to the whole project area in order to reach as many people as possible. The locations can be for example schools, clinics, churches, market places, or any places that people gather to. The places are decided together with locals. Public toilets can be difficult for the locals to feel as their own. This sense of ownership can be increased by forming groups or clubs that are responsible for the toilets. There should always be someone who is responsible for maintaining and cleaning the toilets. [40]

The building of **household toilets** can be done using *cost-sharing method*. It means that the family that builds the toilet pays some part of the costs, and the project pays the rest. For example, the family can provide sand, stones and bricks while the project provides cement for the base of the toilet. After the toilet base is done, the family builds walls and roof, and after that the project can provide a ventilation pipe. This way people can afford the toilets, but also invest in them so that it becomes important for families to use and maintain the toilets properly. In addition, when the project provides for instance the ventilation pipe, families are more motivated to finish the toilets in time. The cost-sharing can be applied also to the building of public toilets, for example in schools. Another method can be to lend money for construction when a part or all of the money is slowly paid back to the donor. [31, 33, 36, 41, 42]

The main reason for many people to get a dry toilet is the fertilizer from dry toilets and its financial benefits. In addition, for example the permanence of dry toilets compared to pit latrines or the status of having a proper sanitation facility influence on people's decisions. The design of household toilets should be inexpensive to execute. [31]

Example: Sanitation clubs

In a development project in rural Zambia, sanitation clubs were established to maintain the built public toilets. The clubs became the most important tool to ensure the project's sustainability in the long run. With the help of sanitation clubs people took responsibility for their communities' sanitation and hygiene issues and developed their participation, leadership skills and ownership of the project. Also sanitation issues were promoted more in the communities. The clubs could be joined by anyone who was interested and paid a small membership fee. The clubs had activities such as raising funds by selling vegetables grown using toilet fertilizers. The factors that led to success of clubs were good leadership, committed members, and effective fundraising methods. Also a central committee was founded to be an umbrella organization for the clubs. It had 2–3 representatives from each club and its role was to monitor and encourage the clubs. [18, 19, 21, 33]

Example: Community-based enterprises

In a dry sanitation development project in Lusaka, Zambia, one important feature was the established community based enterprises (CBEs). These CBEs work with different activities that the project has provided, such as construction of dry toilets, emptying the toilets, and using the toilet fertilizers. They provide continuation for the project as well as income for the beneficiaries. [30]

3.3 Demonstration fields

It depends on the project how the treatment, collection, and use of toilet fertilizers are executed. In some projects local people may use the fertilizers in their gardens but in other projects the manure can be collected and utilized by enterprises and farmers. Depending on the toilet model, the toilet waste can either be stored in the toilet chamber until it is decomposed or dried, or it can be moved to another place, for instance to a compost located next to the toilet, to decompose. In some toilet models urine is diverted from manure, which enables the use of urine as a fertilizer. In any case, the storing and using of toilet fertilizers has to be done strictly according to the instructions. Proper education is needed to avoid misuse of toilet fertilizers, which can lead to health problems or loss of yield. [17]

The project and its participants can establish demonstration fields in order to test the use of toilet fertilizers and to show the results and gained benefits to local people. Having a demonstration field in different parts of the project area is important in order to allow all people to see the benefits of the dry toilet fertilizers. The grown vegetables can be sold or given to people in gatherings so that the stigma around them can be reduced. If the crops are meant to be sold in the project area, education and awareness rising in market places is essential so that people are not afraid to buy these products. [21, 30, 43, 44]

3.4 Schools

One way that the improved ecosan systems can influence people's lives are the toilets built in schools. They increase school attendance and improve the efficiency of learning. Proper sanitation facilities in schools are important especially for girls, which supports gender equality. Schools are also good places to organize workshops for the communities and of course to give pupils sanitation and hygiene education. Education about these matters is vital in order to keep the toilets clean and well maintained, but also to make children think positively about dry sanitation and the importance of hygiene. This message reaches the pupils most efficiently if the school has a garden where dry toilet fertilizers are applied. However especially younger pupils may not understand how to use dry toilets. This problem can be solved by restricting the use only for older pupils.

When toilets are built to a school, it is essential that the headmaster and teachers are motivated and understand the importance of proper sanitation. The responsibility of the maintenance of toilets should be divided for example between classes, or a special sanitation group can be established to maintain the toilets. Some kind of rewards can be given to motivate pupils to work together for the toilets. Good monitoring is needed to ensure that the toilets are used and maintained properly. If the maintenance of toilets is difficult to execute voluntary by the pupils and school staff, a maintainer can be hired to take care of the toilets. This can be more efficient but also more expensive for the school or the community. [8, 21, 30, 45, 46]

Establishing a demonstration field or garden at the school yard is a perfect way to show the pupils the benefits of composting toilets. The children can take part in fertilizer use in turns or by joining school's sanitation group. It is vital that there is an adult who supervises the use of fertilizers and that children are properly trained to do it in a hygienic way. The most rewarding situation is when pupils can eat the vegetables or fruits grown by using toilet fertilizers. Besides of providing them a good snack this also gives them a good experience of nutrient cycle. [36]

4. SUSTAINABILITY

"Project support is a temporary shot in the arm with which the partner's resources can be boosted." – Ministry for Foreign Affairs of Finland

Even though development projects are time-limited and unique, their results are supposed to be long-lasting and sustainable. Development projects aim at improving the role of local people, communities and NGOs to take responsibility for their own development. Sustainability of an ecosan project can be ensured by all the things introduced in the previous chapters.

As conclusion, they are:

- ensuring that there is demand for new toilet facilities
- sensitization of local people as well as village and district leaders
- development of toilet model(s) suitable for the project area
- participatory education on use, maintenance and repairing of toilets
- construction of household toilets using cost-sharing method
- showing all the benefits gained from ecological sanitation: safety and hygiene, permanent structure, lack of smell, free fertilizer.
- education on capacity building, project management, leadership skills, community mobilization, fundraising, et cetera
- ensuring that the community takes responsibility of the project activities, in a form of for example sanitation clubs

Co-operation, participatory methods, and capacity building are needed to succeed in these things. Sustainability is important to be evaluated in all phases of the project to ensure the continuity of the work. At the end of the project, a workshop or other gathering can be organized to discuss the topic of sustainability with locals and to encourage them to plan activities and set their own goals in order to ensure the continuity of the project activities. **Sustainability strategy** should be made and responsibilities discussed with the local partner. The final thing to ensure sustainability is an **exit strategy**. [11, 24, 47]

Exit strategy is vital for the sustainability of every project and it should be included already in the planning phase of the project. Exit strategy ensures that when the actual project withdraws from the area, the full responsibility has been passed to the local people and communities who continue working to improve their lives. Development project should not ever create dependence on the donor. To ensure this, the local partner must have an active role and for example seek other sources of funding. [10, 11, 24]

5. MONITORING AND EVALUATION

Monitoring is done continuously throughout the project and is based on the planned objectives, activities and results. Monitoring is a tool to follow progress – the successes and failures – and based on these to make changes in the project in order to reach the objectives more efficiently. The idea of monitoring follows the principles of PDCA model of Deming: Plan, Do, Check, Act. Regular monitoring helps the project management to be aware of what happens during all phases of the project. Monitoring also provides useful information for evaluation. The achieving of results can be monitored by comparing the planned results to those that have been reached. It is vital that the project management is objective and reports also possible failures. Cost-effectiveness of the project is assessed continuously during the project. The monitoring is done by the local management level and the donor level that in most cases visits the area regularly. Monitoring has to find out the experiences and views of beneficiaries. This is done by discussing with locals and making interviews. One good method is that the beneficiaries assess the results against their own goals. Other methods that can be used are SWOT analysis, literature reviews, and general observation. [10, 13, 19, 23, 24, 41, 47]

Usually there are **mid-term** and **final evaluations**, and in some projects **annual evaluations**. They have to be done systematically and objectively, assessing the whole project from planning to the results. Also the long-term influences should be evaluated. Evaluation is in the best case made in co-operation with the ones who utilize the results. The participatory methods introduced above can be utilized also when making project evaluations. Evaluations should be made in a way that they can be utilized to develop similar projects. Both the donor and the beneficiary side can learn from the project and develop their activities. [13, 48, 49]

Well-defined and measurable indicators are requirements for proper monitoring and evaluation, and it is important to have the same criteria throughout the whole project. Indicators have to be set in the planning phase to follow the project's overall objectives and results. It is important that the indicators are set together with the beneficiaries in order to find the project's impacts on their lives. In addition, the ways of following the indicators during the project have to be clear. [13]

Qualitative data that is collected can include for instance following things:

- local people's experiences from the project
- people's opinions and suggestions
- level of awareness and approval of the project
- behavioural change
- operation and maintenance of the toilets

Some examples of **quantitative** data that can be collected during the project are:

- number of built toilets, number of people using them
- number of education events and their participants
- number of people with knowledge to construct dry toilets
- number of hand-washing devices
- data on health and diseases
- a total number of beneficiaries

[21, 22, 23, 24, 41]

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